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ELECTRICITY IN RURAL AREAS OF NORTH TEXAS

THESIS

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Texas State Teachers College in Partial
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For the Degree of

MASTER OF SCIENCE

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CHAPTER I

INTRODUCTION

Introduction to the Problem

Electricity has been taught for many years in the public high schools in the larger cities of Texas, but has only recently been taught in the junior high schools and offered to the younger boys and girls on a general basis as a part of general education.

In an interview with W. C. Pate, vice-principal of Technical High School of Fort Worth, it was found that vocational electricity had been offered to the students of this school since 1925. The students learn how to do house-wiring, install electrical equipment, rewind motors, and to do other general repair work.

According to John Cherry, Director of Industrial Arts Education in the Fort Worth public schools, electricity was first offered to the junior high school students of this city in the Meadowbrook Junior High School in 1944, and is now taught in seven junior high schools for white children and in three junior high schools for Negroes. The students at these schools work with low-voltage electricity from which

they learn the rudiments of making joints and splices, house-wiring and bell systems. It was found from the experiences of the teachers of industrial arts of this city that junior high school students were not mature enough to safely work with electrical equipment that required 110 volts of power, but that senior high school students could handle safely this more powerful equipment.

A non-vocational course in electricity is offered to the students of Crozier Technical High School of Dallas. According to Perry Fite, vice-principal of this school, this work was given to take care of the needs of students who were preparing to enter the various electrical trades upon graduation from high school. Some electrical work is taught in the junior high schools of Dallas, but only in connection with those phases of electricity which pertains to the wood or metal shop courses as offered in those schools.

These two cities are located in areas adjacent to the area included in this study, and offer to their students at public expense both elementary and vocational courses in electricity. If equal educational opportunities are to be offered to all the youth of this state, the same courses must be offered to them at public expense.

Statement of the Problem

The purpose of this study is to determine if instruction dealing with the use of electricity and electrical equipment

was needed and wanted by the families living on electrified farms in the North Texas Area and, if so, should the public high schools include this instruction as a part of their curricula? Data were sought which would determine in what high school courses this instruction should be given if any needs were found to exist.

Limitations of the Study

This study is limited to the educational needs of the families living on electrified farms in the North Texas Area and the responsibility of the public schools to fulfill any indicated needs. As used in this study, "North Texas Area" will mean that section of Texas covered by the following counties: Archer, Clay, Collin, Cooke, Denton, Grayson, Jack, Montague, Wise, and Young.

Method of Procedure

The following steps were used in conducting this study:

1. The first step in solving this problem is to determine if the families living on electrified farms in the North Texas Area needed and wanted instruction dealing with the use of electricity and electrical equipment, and if they thought the public high schools should fulfill any indicated needs. The study proposes to answer this question by obtaining facts and opinions from a representative group of the families living on electrified farms in the North Texas Area.

2. If it is found that a majority of the rural people interviewed need and want instruction dealing with the use of electricity and electrical equipment for their children, the next step in solving this problem is to determine who should be responsible for giving the instruction. This study proposes to answer this question by obtaining facts and opinions from the public school superintendents, teachers of industrial arts, teachers of home economics, teachers of agriculture, high school principals, county agents, home demonstration agents, and managers of electric co-operatives, who worked in the area covered by the survey.

Sources of Data

In obtaining the data for this study a survey was made of the following North Texas counties: Archer, Clay, Collin, Cooke, Denton, Grayson, Jack, Montague, Wise and Young. These data were obtained by interviewing 205 men and women living on electrified farms and by submitting questionnaires to 200 high school superintendents, high school principals, teachers of industrial arts, science, home economics and agriculture, managers of electric co-operatives, county agents, home demonstration agents, and county superintendents in the counties surveyed. Additional data were obtained from professional literature in the fields of education, agriculture, industrial arts, home economics and rural electrification.

Definition of Terms

The word "ampere" indicates the unit of measure of the rate of flow of electrical energy per second in a conductor. The ampere may be compared to the number of gallons of water per minute coming out of a faucet.

In this study, the term "central-station of electricity" means that electric power or energy generated in one electric generating plant and distributed to many customers scattered over a wide area.

As used in this study, the word "core" means that part of a school's curriculum around which all other instructional materials are built.

The term "electrical appliance" indicates those household or non-household appliances which use electricity.

The term "electrical co-operatives" means those organizations authorized by the Rural Electrification Act of 1936 to borrow money from the Federal government to build electric lines and, where necessary, to build and operate electric generation plants to help farmers and other rural people get electricity.

"Electricity" as used in this study, means that force, energy, or power transmitted to its users by means of copper wire for the purpose of obtaining heat, light, and power.

When the term "household electrical equipment" is used in this study it indicates those electrical appliances used

mostly inside a home, such as floor lamps, radios, phonographs, sweepers, toasters, and coffee makers.

By "Industrial Arts" is meant that phase of general education for both boys and girls that concerns itself with the materials, processes, and products of manufacture, and with the contribution of those engaged in industry, in which the learning comes through the pupils' experiences with tools and materials and through their study of resultant conditions of life.

The "watt" is the unit of measure of the amount of work done by electrical energy when there is a flow of current of one ampere at a pressure of one volt. It is a unit of measure of electricity, the same as the bushel, mile, rod, and peck are units of measure. The word "kilowatt" as used in this study means a thousand of the above-described units of measure of electric power.

As used in this study, "non-household electrical equipment" means that electrical equipment used mostly outside a home, such as electric water pumps, electric milking machines, and electric brooders.

The word "transformer" indicates that piece of electrical equipment used to reduce the voltage carried on a transmission or power line so the electric current may be used for light or power in the home or on the farm.

A "volt" indicates the unit of measure of pressure that causes the flow of an electric current in a conductor.

Recent and Related Studies

Many books have been written and many studies have been made dealing with the educational needs of boys and girls in regard to the use of electricity and electrical equipment. Of the books and studies reviewed in this field, the following were found to be the most pertinent.

The American Technical Society secured the services of several authors, scientists, physicists, and men who had been teaching electricity to beginners. They prepared a book through which the fundamental principles of electricity might be presented to the beginner by making comparisons with some everyday facts with which almost everyone is familiar. This book did not attempt to include all the facts and information on electricity but dealt only with the basic principles of the properties of electrical energy.¹

Melvin S. Lewis and John H. Dillon compiled and published in 1932 a set of instruction sheets for use as core instructional material in electricity as this subject is usually taught in the general-shop organization of industrial arts in junior high schools and the small high schools. In this

¹
W. Esty, R. A. Millikan, W. L. McDougal, Elements of Electricity, 1946.

study, the more common phases of electrical work found where electricity is used for household lighting, heating, and power purposes were surveyed and that material selected which the authors found would appeal to the interests of adolescent boys and contribute to their better understanding of fundamental tools, materials, and processes in this field. A check of the content of this study was obtained from the results of questionnaires sent to a selected list of teachers of general shop work throughout the country. The material was further checked by teachers who used this material in the schools of Indiana for a period of one year.²

Robert Stollberg wrote and published a treatise in 1941 concerning the teaching of selected material from the field of electricity. This monograph was prepared to help secondary school and college teachers use their training in electricity to achieve objectives that are functional in the lives of boys and girls and the communities in which they live. In the "Foreword" of this treatise the author states:

In a world dominated by scientific progress, knowledge of electricity is increasingly important to a consideration of issues, problems, and interests that are the concerns of everybody. Power from fuels and from falling water is distributed through wires to homes and industry to be used as needed. This fact is immediately pertinent in considering such questions as:

What are the potentialities for use of the world's resources? What opportunities are there for expansion of industry? What occupational opportunities are open and may be opened to workers? What does it cost to extend the use of light and power in cities so that streets may be better lighted and in rural regions so that homes and highways may be better lighted and farmers may have the advantages of use of modern machinery? ³

H. H. London and Robert Wayne Adams conducted a study in 1947 to determine the need for more knowledge of electricity. In this study, facts and opinions were sought from 2,085 operators of electrified farms and from more than 700 professional workers in Missouri who were managers of electric co-operatives, agricultural agents, home demonstration agents, agriculture teachers, and industrial arts teachers. The farm operators were asked what they thought men, women, boys and girls living on electrified farms should know about electricity. A majority of both groups believed that family members should know the following things concerning electricity:

1. How to select and purchase household electrical equipment
2. How to operate and care for household electrical equipment.
3. How to estimate the cost of operating household electrical equipment
4. How to read a meter and figure a monthly bill
5. How to avoid overloading circuits and blowing fuses
6. How to select and replace fuses

7. How to plan the lighting of a room or building
8. How to make simple repairs on household electrical equipment
9. How to locate and eliminate the causes of blown fuses
10. How to determine whether or not it would be profitable to buy electrical equipment
11. How to plan the wiring of a building
12. How to select and purchase non-household electrical equipment
13. How to operate and care for non-household electrical equipment
14. How to estimate the cost of operating non-household electrical equipment
15. How to make simple repairs on non-household electrical equipment
16. How to change hand-operated machines to machine-operated machines
17. How to rig up a portable motor
18. How to install new lighting or convenience outlets and switches
19. How to install a new circuit in a building
20. How to wire a building for electricity
21. How to do special wiring required in installing electrical equipment.

The professional workers suggested many ways to help families learn more about the use of electricity. For men and women. Include instruction dealing with the use of electricity in the educational programs of agencies serving rural communities. Conduct short courses dealing with the use of electricity for residents of electrified homes and farms in the community. Distribute educational literature on the use of electricity to residents of electrified farms in the community.

For boys. Include instruction dealing with electricity in agriculture courses in high school. Include instruction dealing with the use of electricity in programs of such youth organizations as 4-H clubs and Future Farmers of America. Include instruction dealing with electricity in high school science courses. Include instruction dealing with electricity in industrial arts shop courses in high school.

For girls. Include instruction dealing with electricity in home economics courses in high school. Include instruction dealing with electricity in high school science courses. Include instruction dealing with electricity in programs of rural youth organizations. If this information on rural electrification is fairly

representative of the situation over the nation and if the need for a more thorough knowledge of electricity and its uses on the part of rural families is equally widespread, there is a big job to be done. This job, properly done, should yield tremendous dividends in safety, convenience, and greater operating efficiency for rural people.

Obviously, Rural Electrification Administration Co-operatives and other suppliers of electricity and electrical equipment are interested in this problem, for education is a factor in increasing the use of electricity and the sale of electrical equipment. The problem is one that should also concern the many public agencies established to serve rural residents, including teachers of home economics and home demonstration agents.⁴

F. M. Hunter and D. E. Washburn compiled and published a series of exercises in 1940 for the purpose of providing extension workers and other agricultural leaders with a definite procedure for extending rural electrification lessons to boys' groups. These exercises were correlated with the training course "Wiring and Lighting the Farmstead," which previously had been made available to most agricultural workers through the state extension services of Tennessee, Alabama, Georgia, and Mississippi. These exercises, based on field experiences obtained in Mississippi, follow.

- | | |
|--------------|---|
| Exercise I. | Splicing, Soldering, Taping |
| Exercise II. | A study of wiring materials and workmanship |

Exercise III.	How to read your electric meter
Exercise IV.	Planning a wiring job and estimating materials
Exercise V.	How to install a convenience outlet
Exercise VI.	Installation of single pole wall switches
Exercise VII.	Three-way switches
Exercise VIII.	Service entrance installations
Exercise IX.	Building a homemade yard light
Exercise X.	A study of outside wiring
Exercise XI.	Building a homemade electric brooder
Exercise XII.	Constructing an electric hotbed
Exercise XIII.	Making a motor portable
Exercise XIV.	Laboratory use of ammeter and volt meter
Exercise XV.	Voltage drop and how to use voltage drop tables. ⁵

From the books and studies reviewed it was found that most of them deal with the proper methods to be used and the proper materials to be included in high school courses in electricity and one deals with the need for more knowledge of the use of electricity in the State of Missouri. However, none of the studies found pertained to the educational needs of the people living in the rural areas of Texas or the responsibility of the public high schools to take care of any needs found to exist among these rural people.

Other studies have been made and other books have been written that deal with electricity but only those books and studies found by this study to be the most pertinent were included in this review. Other books and studies not listed

⁵
D. E. Washburn and R. M. Hunter, Rural Electrification Lessons for Boys' Groups, p. 2.

here but which deal with electricity can be found in the bibliography of this study.

Before going into the research part of this study, it would seem that a study dealing with the historical background of the use of electricity should be made and this will be given in the next chapter.

CHAPTER II

HISTORY, DEVELOPMENT, AND USE OF ELECTRICITY

Although many of the properties of electrical phenomena were known to the ancient people of the East and many important discoveries were made in the field of electricity through the ages, it was not until the discoveries of Faraday in England and Henry in the United States that the knowledge we now have of electricity began to take shape. It was to their discoveries that such inventors as Samuel F. B. Morse, Alexander Graham Bell, and Thomas A. Edison owed their success.¹

Arc lights were used for street lights in some cities before Edison perfected the electric light bulb in 1897 which could be conveniently used in homes, offices, and factories. His Pearl Street Station in lower New York, established in 1882, was the first central electric station with lines covering a square mile.²

However, direct current, which was then used, could not be transmitted very far and seriously limited the increased

¹ Ralph A. Richardson, Electricity and Wheels, p. 15.

² Ibid., p. 16.

use of electricity. This difficulty was overcome by the invention of the alternating current transformer and the successful testing of this new form of power at Great Barrington, Massachusetts, in 1886.³ By using this new form of power, large voltages of electricity could be transmitted over power lines for great distances and, by using the new transformer, branch lines for home consumers could be erected at any place along a power line if needed. This was quickly followed by the invention of the first practical induction motor and the "stopper" lamp by George Westinghouse and Nickola Tesla.⁴

These inventions and others that have followed have set in motion a trend that has literally changed the lives of the people of this country. From the small beginnings of Edison's Pearl Street Station in New York has grown the vast electrical industry that we have today. Where only a few electric lines once served homes and offices in one square mile of one city, electric power has spread to practically every city and town in America.

The first cities in New England grew up along the swift-flowing streams because the industries of that time depended upon water power. With the development of steam

³ National Electrical Manufacturers Association, A Chronological History of Electrical Development, p. 56.

⁴ Westinghouse Electric Corporation, George Westinghouse, pp. 5-6.

power, as a result of the discovery and mining of coal, cities grew up near large supplies of coal. This growth of many thickly built cities around factories was necessary because the machinery had to be located near the sources of its power.⁵

However, because electricity distributes the power which, though produced by steam and water, can be carried through wires to great distances, great changes have been and are still being produced in modern ways of manufacturing. Where the trend in this country once showed that people moved from the rural areas to fill the new jobs created by the establishment of new industry in the highly congested metropolitan areas near the sources of power, it is now found that many new industries are being established in the less congested areas, farther and farther from the sources of power.⁶

The first electric motors were crude affairs but those now manufactured rival the precision and exactness of the finest watches. All the improvements of modern science are used to produce electric motors to practically any specifications desired by any manufacturer to perform almost any job which requires the power of a motor. A motor can be

⁵Federal Security Agency, National Youth Administration, Electricity, The Modern World At Work, p. 14.

⁶Ibid.

either large or small and can be made to do many kinds of work. There are electric motors that drive railroad locomotives and steamship propellers, others that supply the power for dentists' drills, housewives' sewing machines, and farmers' feed mills. There are still other motors that turn the spindles in the large cotton and woolen mills, run the lathes, shapers, and milling machines in the machine shops of industry, and power the elevators found in all modern office buildings and factories.

Electric power is not confined to running the motors of industry and furnishing light for our homes. In the modern hospital electric power makes possible the powerful lights that enable the surgeons to work under the same conditions as though it were the brightest day. It makes possible the X-ray machines without which the modern doctor would be lost. It furnishes the heat by which the surgeon's tools are sterilized and the spread of disease is eliminated.

In the modern home today a man can be awakened by an electric alarm clock after being kept warm all night by an electric blanket, drive away the darkness or gloom with an electric light, turn on the electric heater or furnace for warmth, brush his teeth with an electric tooth brush and shave with an electric razor, eat a breakfast of food kept fresh in an electric refrigerator or deep-freeze unit and cooked on an electric stove, listen to his favorite programs

on a radio, and ride to work in an electric street car or train. However, the widespread use of electricity was not accomplished in one day.

Between 1902 and 1935 the per capita consumption of electric power in this country increased from thirty to more than 730 kilowatt hours per year, which was more than fifteen times the rate of population growth in the same period.⁷ By 1935 more than twenty-one million homes, about eighty per cent of the total, were wired for electricity.⁸ However, until 1935, very few power lines had touched any of the rural areas of this country. The commercial companies which supplied electric power had spread only to those rural areas that surrounded the cities and towns and the more distant areas were left without the help, for production and for convenience, which the people of the urban areas had possessed for many years. In 1935, only eleven American farms out of every 100 had central station electricity. In fourteen states, fewer than four farms in every 100 were served by electric power lines. More than five million American farms lacked electric service.⁹

⁷ National Resources Committee, Technological Trends and National Policy, pp. 250-251.

⁸ Ibid., pp. 318-325.

⁹ Rural Electrification Administration, A Guide for Members of Rural Electric Co-ops, p. 4.

With the passage of the Rural Electrification Act of 1936 the electric power lines, which had stopped at the fringes of the populous towns and villages, began to spread over rural America, not only to those areas where people lived quite close together, but also to those areas where the farm homes were more scattered. At the end of 1946, about fifty-seven per cent of the rural homes of America had electric service.¹⁰

Rural America is using far more electricity today than it once thought it would ever use. The demands for power strain the ability of many suppliers to meet them. The managers of electric co-operatives who never believed their rural customers would use as much as 100 kilowatt hours per month on the average now plan systems for an average future farm use several times as high.¹¹

Thousands of farmsteads are not wired for full power use and some farmers, realizing this, are increasing the capacity of their old electric wiring with new larger wire to run the motors and other equipment that can spell savings of man-hours of labor on the farm. But many others do not yet see what adequate wiring of their farmsteads can mean in savings of

¹⁰

Rural Electrification Administration, op. cit., p. 6.

¹¹

"Planning for Full Power Use," Rural Electrification News, (June-July, 1948), p. 7.

time and labor.¹²

An electric manufacturer predicted that rural electrification would increase thirty-five per cent by 1957. This prediction was made by B. W. Clark, vice-president of Westinghouse Electric Corporation, in a speech prepared for the third national electrification conference. He estimated that farm sales of electrical appliances would total \$6,350,000,000 in the next decade.¹³

The Federal Power Commission, in its Power Market Survey, State of Texas, makes the following statements in regard to the use of electricity in the rural areas of Texas:

In 1923, the earliest year for which data are available, there were only 2,100 farms receiving central-station electric service in Texas. By 1930 the number of such farms had increased to 11,500 or almost 450 per cent.... With the advent of the Rural Electrification Administration, the number of electrified farms increased to 116,204 by 1941, or a total gain of 104,124 over 1935. This represents an average gain of approximately 17,350 farms per year during the six-year period.

Based on data contained in the 1945 United States Census of Agriculture, it is estimated that at the end of 1945 there were 144,350 electrified farms in Texas with central-station service, or 37.6 per cent of all farms. The distribution.... is estimated to vary from a saturation of 11.5 per cent in the Big Bend Area to

¹²

Ibid.

¹³

"Boost in Rural Electrification Is Forecast," Fort Worth Star Telegram, (November 18, 1948), p. 51.

74.7 per cent in the El Paso Area. By 1965 it is estimated that the number of central-station farm customers in Texas will increase to 273,000, representing 72.2 per cent of all farms and ranging from fifty per cent in the Big Bend area to 83.3 per cent in the El Paso area.¹⁴

In the Progress Report to the Texas Committee on the Relation of Electricity to Agriculture of 1944 it was found, as shown in Table 1, that of the 130,000 Texas farm homes surveyed, all had electric lights, ninety per cent had radios, eighty-five per cent had electric irons, fifty-five per cent had electric refrigerators, thirty per cent had electric washing machines, and twenty-five per cent had electric-powered water systems. A small percentage of the homes had such electrical appliances as ironers, ranges, vacuum cleaners, water heaters, and other miscellaneous equipment which shows that many of the more expensive but less necessary items of electrical equipment are beginning to find their way into rural homes, whereas those items of electrical equipment which contribute most toward improving the general well-being of the rural families, such as irons, lights, refrigerators, and radios are the first items purchased by a family upon being connected to a central-station power line.¹⁵

¹⁴ Federal Power Commission, Bureau of Power, Power Market Survey, State of Texas, (June, 1948), pp. 87-88.

¹⁵ P. T. Monfort, Progress Report to the Committee on the Relation of Electricity to Agriculture, pp. 9-10.

TABLE 1

THE USE OF ELECTRICAL EQUIPMENT IN 130,000 RURAL
HOMES OF TEXAS IN 1944 AS FOUND BY A SURVEY
CONDUCTED BY THE DEPARTMENT OF AGRICULTURAL
ENGINEERING OF THE AGRICULTURAL AND
MECHANICAL COLLEGE OF TEXAS *

Equipment	Present per cent satura- tion	Number in use	KWH Used per Year	
			Per unit	Total (000)
Wiring home	100	130,000		
Lights- home	100	130,000	240	31,200
Iron	85	110,500	100	11,050
Radio	90	117,000	60	7,020
Refrigeration				
Household	55	71,500	480	34,320
Freezer chest	--	3,500	1,620	5,670
All purpose	--	200	3,600	360
Water system	25	32,500	300	6,500
Washer	30	39,000	30	1,170
Ironer	1	1,300	100	130
Range	5	6,500	1,140	9,360
Dishwasher	--	100	90	9
Vacuum cleaner	6	7,800	10	78
Water heater	2	2,600	3,000	7,800
Misc.appliances	80	104,000	60	6,240

*

Progress Report to the Committee on the Relation of
Electricity to Agriculture.

Table 2 shows the use of electrical equipment on 130,000 Texas farms as found in a survey conducted in 1944.

TABLE 2

THE USE OF ELECTRICAL EQUIPMENT ON 130,000 TEXAS FARMS
IN 1944 AS FOUND BY A SURVEY CONDUCTED BY THE DE-
PARTMENT OF AGRICULTURAL ENGINEERING OF THE
AGRICULTURAL AND MECHANICAL
COLLEGE OF TEXAS

Equipment	Present % saturation	No. in use	KWH used per year	
			Per unit	Total (000)
Wiring yards and barns	30	--	--	--
Lighting yards and barns	30	39,000	200	--
Water system	--	--	--	3,250
All purpose re- frigeration	--	--	--	360
Milk cooler	--	8,000	3,600	28,800
Milker	--	5,000	400	2,000
Cream separator	--	4,000	35	140
Dairy water heater	--	800	2,400	1,920
Incubators	--	500	100	50
Brooders	15	19,500	200	3,900
Lights for pro- duce	8	10,400	60	674
Feed grinder (1-5 HP)	--	500	500	250
Feed Mixer	--	400	100	40
Handling equipment	--	300	60	18
Farm shop	4	5,200	60	312
Portable motors (1/4-1/2 HP)	8	10,400	48	499
Portable motors (1-5 HP)	--	300	120	36

The data for Table 2 were secured from the Progress Report to the Committee on the Relation of Electricity to Agriculture.

All these items of electrical farm equipment tend to make life on the farm more pleasant. In the "State Reports" section of the Annual Report, U. S. Rural Electrification Administration, 1938, the following quotation is found concerning rural electrification in Texas:

The strongest influence in the back-to-the farm movement... is that of bringing modern conveniences to the farm. And probably the one modern convenience that contributes most to farm contentment is electricity... The rural electrification movement is one calculated to encourage farming and make rural life happier, thereby strengthening the foundations of our civilization.¹⁶

Yet, little or nothing has been done in the past to help rural families learn more about the use of electricity and electrical equipment. Many rural people do not know how to purchase that electrical equipment which will best do the work for which it is intended. Many farmers, at a distance from town and experienced electricians, lose many man-hours of work because they do not know how to make the most simple adjustments and repairs on their electrical equipment. Many man-hours of labor would be saved and farm income would be

16

Annual Report, U. S. Rural Electrification Administration, 1938, p. 178.

increased if some member of each farm family knew how to make simple electrical installations, adjustments, and repairs.

With this in view, the writer felt that there were certain data that should be collected from the rural families and professional people in each community in the North Texas area to determine if training in the installation, adjustment, repair, and use of electrical equipment would aid these rural people and if they believed this instruction should be given by the public high schools in each community. The results of the survey conducted in the rural areas of North Texas follow in the next chapter.

CHAPTER III

PRESENTATION OF DATA

Data Obtained from the Interviews with the Men and Women Living on Electrified Farms in the North Texas Area

The interview conducted among the 205 rural families of North Texas dealt with the troubles encountered in their use of electricity and electrical equipment, what these men and women wanted their boys and girls to learn, and who these people believed should give any wanted and necessary instruction to their children. These data were collected by interviewing 205 rural persons living on electrified farms in the North Texas area who use electricity and electrical equipment.

This interview dealt with the types of electrical work performed in the everyday home and farm use of electricity and electrical equipment. A list of the types of work common to the rural use of electricity follows.

1. Select and purchase household electrical equipment
2. Operate and care for household electrical equipment
3. Estimate the cost of operating household electrical equipment
4. Read a meter and figure a monthly bill
5. Avoid overloading circuits and blowing fuses
6. Select and replace fuses

7. Plan the lighting of a room or building
8. Make simple repairs on household electrical equipment
9. Locate and eliminate the causes of blown fuses
10. Determine whether or not it would be profitable to buy electrical equipment
11. Plan the wiring of a building
12. Select and purchase non-household electrical equipment
13. Operate and care for non-household electrical equipment
14. Estimate the cost of operating non-household electrical equipment
15. Make simple repairs on non-household electrical equipment
16. Change hand-operated machines to machine-operated machines
17. Rig up a portable motor
18. Install new lighting or convenience outlets and switches
19. Install a new circuit in a building
20. Wire a building for electricity
21. Do special wiring required in installing electrical equipment.¹

The cooperation of the men and women interviewed while making this study was very pleasing. They were, in most cases, vitally interested in any work which concerned a better understanding of the proper use of electricity and electrical equipment and the repairs and installations which could be made by properly trained members of the family. Many comments were encountered which seemed to reflect the needs and desires of these rural users of electricity. Typical comments were:

North Texas farmer: "When something goes wrong with

¹

London and Adams, op. cit., p. 252.

the electrical system on my farm, I have to get an electrician from town to make the needed repairs. This is expensive and a lot of time is lost."

North Texas farmer's wife: "Every time something happens, my husband is away from the house. Unless a woman knows something about making simple electrical repairs she is lost."

Table 3, which follows, gives a list of the questions asked and the responses given by the rural men and women concerning the troubles they have encountered in their use of electricity and electrical equipment, what they wanted their boys and girls to learn in regard to the use of this power, and who they believed should give any needed and wanted instruction.

It is significant that even though seventy per cent of the men and women who were interviewed while this study was being made had never encountered trouble doing the various types of work listed in Table 3, ninety-eight per cent of these people wanted this type of instruction given to the boys in their own communities and eighty eight per cent of them wanted similar instruction given to the girls in their communities. More than ninety-eight per cent of all the men and women who were interviewed thought that this instruction should be given by the public high schools in their own communities.

TABLE 3

THE RESPONSES GIVEN BY THE TWO HUNDRED AND FIVE MEN AND WOMEN LIVING ON ELECTRIFIED FARMS IN THE NORTH TEXAS AREA TO THE QUESTIONS ASKED CONCERNING THE USE OF ELECTRICITY AND ELECTRICAL EQUIPMENT

Types of electrical work performed by rural people who use electricity	Have you encountered trouble in doing this type of work?		Do you want instruction in this type of work given to the boys and girls in your community?				Do you think this instruction should be given by the public high school?	
	Yes	No	Boys		Girls		Yes	No
			Yes	No	Yes	No		
1. Select and purchase household electrical equipment	74	131	203	2	191	14	201	4
2. Operate and care for household electrical equipment	59	146	203	2	190	15	202	3
3. Estimate the cost of operating household electrical equipment	57	148	203	2	189	16	201	4
4. Read a meter and figure a monthly bill	71	134	205	0	190	15	202	3
5. Avoid overload circuits and blowing fuses	70	135	205	0	190	15	202	3
6. Select and replace fuses	42	163	205	0	198	7	201	4

TABLE 3--Continued

Types of electrical work performed by rural people who use electricity	Have you encountered trouble in doing this type of work?		Do you want instruction in this type of work given to the boys and girls in your community?		Do you think this instruction should be given by the public high school?	
	Yes	No	Boys Yes	Boys No	Girls Yes	Girls No
7. Plan the lighting of a room or building	56	149	205	0	189	16
8. Make simple repairs on household electrical equipment	55	150	205	0	189	16
9. Locate and eliminate the causes of blown fuses	70	135	205	0	189	16
10. Determine whether or not it would be profitable to buy electrical equipment	57	148	205	0	189	16
11. Plan the wiring of a building	66	139	201	4	173	32
12. Select and purchase non-household electrical equipment	42	163	201	4	172	33
13. Operate and care for non-household electrical equipment	44	161	201	4	170	35
					202	3
					201	4
					201	4
					202	3
					202	3
					202	3
					202	3

TABLE 3--Continued

Types of electrical work performed by rural people who use electricity	Have you encountered trouble in doing this type of work?		Do you want instruction in this type of work given to the boys and girls in your community?				Do you think this instruction should be given by the public high school?	
	Yes	No	Boys		Girls		Yes	No
			Yes	No	Yes	No		
14. Estimate the cost of operating non-household electrical equipment	54	151	201	4	172	33	202	3
15. Make simple repairs on non-household electrical equipment	56	149	201	4	172	33	202	3
16. Change hand-operated machines to power-operated machines	69	136	201	4	172	33	202	3
17. Rig up a portable motor	64	141	201	4	172	33	202	3
18. Install new lighting or convenience outlets and switches	58	147	201	4	172	33	202	3
19. Install a new circuit in a building	71	134	201	4	172	33	202	3

TABLE 3--Continued

Types of electrical work performed by rural people who use electricity	Have you encountered trouble in doing this type of work?		Do you want instruction in this type of work given to the boys and girls in your community?				Do you think this instruction should be given by the public high school?	
	Yes	No	Boys		Girls		Yes	No
20. Wire a building for electricity	66	139	201	4	172	33	202	3
21. Do special wiring required in installing electrical equipment	76	129	201	4	172	33	202	3

The data contained in Table 3 are figured on a percentage basis and are found in Table 4, which follows.

TABLE 4

THE PERCENTAGES OF THE ANSWERS RECEIVED FROM THE
TWO HUNDRED AND FIVE RURAL MEN AND WOMEN
INTERVIEWED CONCERNING THE RURAL HOME
AND FARM USE OF ELECTRICITY
AND ELECTRICAL EQUIPMENT

Types of electrical work performed by rural people who use electricity	Have you encountered trouble in doing this type of work?		Do you want instruction of this type of work given to the boys and girls in your community?				Do you think this instruction should be given by the public high school?	
	Yes	No	Boys		Girls		Yes	No
			Yes	No	Yes	No		
1. Percentages of answers received concerning types of electrical work encountered mostly inside a home, as considered in the first ten parts of this interview	30	70	99	1	92	8	98	2
2. Percentages of answers received concerning types of electrical work encountered in the farm use of electricity and electrical equipment, as considered in last eleven parts of this interview	33	67	97	3	82	18	98	2

TABLE 4--Continued

Types of electrical work performed by rural people who use electricity	Have you encountered trouble in doing this type of work?		Do you want instruction of this type of work given to the boys and girls in your community?				Do you think this instruction should be given by the public high school?	
	Yes	No	Boys		Girls		Yes	No
			Yes	No	Yes	No		
3. Percentages of answers received concerning the types of electrical work encountered in both the rural home and farm use of electricity and electrical equipment	30	70	99	1	88	12	98	2

The fact that so large a percentage of the people interviewed wanted instruction in the use of electricity and electrical equipment given to the boys and girls in their communities when so small a percentage of those interviewed had ever encountered trouble in doing these types of work may be explained by the fact that when anything went wrong with the electrical systems or electrical equipment in their homes or on their farms, an electrician was called from the nearest town to make the necessary repairs. Many people are afraid of electricity and electrical equipment and will not touch

it if there is the slightest indication it is not operating properly.

It can be seen by comparing the data contained in Table 4 that ninety-two per cent of the people interviewed believed that instruction dealing with the use of electricity and electrical equipment used in homes should be given to the girls in their communities, whereas only eighty-two per cent believed instruction dealing with electrical repairs and installations encountered mostly outside a home should be given to the girls. This may be partially explained by the fact that there are still many people who believe that a woman's place is in the home and any work done outside a home should be taken care of by a man. However, in conducting this survey, many of the people interviewed believed that girls should know how to make electrical repairs and installations used mostly outside the home even though they may never use this information.

Although it is found that a vast majority of the rural people interviewed believe that the boys and girls in their communities should be given instruction dealing with the use of electricity and electrical equipment, the writer felt that there was certain datum that should be collected from the professional people in the North Texas area, people who come in contact with these rural people every day, which

would show whether or not this training would be beneficial and tend to show who should be responsible for giving any wanted and necessary instruction to the children of these rural families. The data obtained from the questionnaires mailed to these professional people are found in the next section of this chapter, which follows.

Data Obtained from the Questionnaires Which Were
Sent to the Professional People in the North
Texas Area

Two hundred questionnaires were mailed to the following professional people in the North Texas area: high school superintendents, high school principals, teachers of industrial arts, science, home economics, and agriculture, managers of electric co-operatives, county agents, home demonstration agents, and county school superintendents. When the count of "filled out" questionnaires was completed, it was found that there were ninety-four which could be used in this study.

All of the professional people contacted while making this survey, with the exception of the managers of electric co-operatives, hold positions of public service and should know the problems, needs, and desires of the rural families living in or near the communities they serve. The managers of the electric co-operatives are not "public servants" but do deal directly with the rural families whose homes and

farms their electric power lines serve and should know the problems that arise in regard to the use of electricity and electrical equipment by these rural people.

For the purpose of analysis, the questionnaires are divided into three groups. Group 1 comprises the public school superintendents and principals; Group 2 includes the teachers of industrial arts, home economics, agriculture, and science, and Group 3 is made up of the questionnaires of the professional people not directly concerned with the education of our youth. There are twenty-five school administrators in Group 1, fifty high school teachers in Group 2, and nineteen of the other professional people in Group 3.

Table 5 shows the number of people of each profession who answered the questionnaire.

The first phase of the questionnaire deals with questions concerning benefits the rural families can gain from the proper use of electricity and electrical equipment. These questions were:

1. Would instruction dealing with the use of electricity and electrical equipment aid the people in the rural areas surrounding your home to use existing electrical facilities more intelligently? Yes_____No_____

2. Would instruction dealing with the use of electricity and electrical equipment help the people in the rural areas surrounding your home to purchase that electrical equipment that is best suited to perform the jobs for which it is bought? Yes_____No_____

3. Would the additional use of electrical farm equipment give the people in the rural areas more leisure time? Yes____No____

4. Would the additional use of electrical farm equipment by the people in the rural areas surrounding your home raise their income and enable them to purchase more of the necessities of life? Yes____No____

5. Would instruction dealing with the intelligent use of electricity and electrical equipment benefit the people in the rural areas surrounding your home? Yes____No____

Table 5 shows the number of people of each profession who answered the questionnaire.

TABLE 5

THE NUMBER OF PROFESSIONAL PEOPLE IN EACH PROFESSIONAL GROUP IN THE NORTH TEXAS AREA WHO ANSWERED THE QUESTIONNAIRE CONCERNING THE EDUCATIONAL NEEDS OF RURAL FAMILIES LIVING ON ELECTRIFIED FARMS

Professional Groups	No.in each group	Total
Group 1		
High school superintendents	23	25
High school principals	2	
Group 1		
Industrial Arts teachers	9	50
Home economics teachers	11	
Agriculture teachers	13	
Science teachers	17	
Group 3		
County School Supts.	5	19
County agents	6	
Home Demonstration Agents	3	
Managers of electric co-operatives	5	
Grand Total		94

Table 6 presents the data obtained from Groups 1, 2, and 3 on these questions.

TABLE 6

THE OPINIONS OF THE NINETY-FOUR PROFESSIONAL PEOPLE CONCERNING THE BENEFITS THE RURAL PEOPLE CAN GAIN FROM THE PROPER USE OF ELECTRICITY AND ELECTRICAL EQUIPMENT

Group	Opinions of Professional People									
	Question 1		Question 2		Question 3		Question 4		Question 5	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1	24	1	25	0	24	1	17	8	25	0
2	50	0	50	0	48	2	37	13	49	1
3	19	0	19	0	19	0	18	1	19	0

Analyses of these data show some significant things in considering whether or not instruction dealing with the use of electricity and electrical equipment and the additional use of electrical farm equipment would aid the rural families in the North Texas area.

Only one professional person out of twenty-five who answered the questions in Group 1 is of the opinion that instruction dealing with the use of electricity and electrical equipment would not aid the people in the rural areas

surrounding his home to use existing electrical facilities more intelligently. All of the professional people in Groups 2 and 3 who answered the questions said they believed this instruction would help the rural people.

All of the professional people in Groups 1, 2, and 3 stated that they believed instruction dealing with electricity would help the rural people to purchase that electrical equipment that is best suited to perform the jobs for which it is bought.

Ninety-one professional people specified that they believed the additional use of electrical farm equipment would give the rural people more leisure time. One of the three dissenting professional people was in Group 1, and two were in Group 2.

Seventeen of the public school administrators in Group 1 believe the additional use of electrical farm equipment by rural people would raise their income and enable them to purchase more of the necessities of life, while eight answered "no" to this question. In Group 2, thirty-seven out of fifty said they believed the rural use of this equipment would aid the rural people. All of the professional people except one in Group 3 answered "yes" to this question.

All of the professional people in Groups 1, 2, and 3 except one stated that they believed instruction dealing

with the intelligent use of electricity and electrical equipment would benefit the people in the rural areas who use electricity. The one professional person whose answer to this question was "no" was in Group 2.

In considering the data, it is apparent that there is not a great deal of diversity among the three groups on the several questions. There are a few dissenters in almost every group, but the concensus of opinion is that the rural families living in the North Texas area do need instruction dealing with the use of electricity and electrical equipment and a large majority of all three groups believe the additional use of electrical farm equipment would be beneficial to these rural people.

The second phase of the questionnaire concerns the types of electrical work that can safely be done by rural people. The questions which follow were asked of each of the professional people included in Groups 1, 2, and 3 of this study.

6. Would instruction dealing with the use of electricity and electrical equipment aid the people in the rural areas surrounding your home in safely making minor electrical installations and repairs that are now done by certified electricians? Yes_____No_____

7. Would instruction dealing with the use of electricity and electrical equipment aid the people in the rural areas surrounding your home in safely making major electrical installations and repairs that now have to be done by certified electricians? Yes_____No_____

Table 7 presents the data obtained from this part of the questionnaire.

TABLE 7

THE OPINIONS OF THE PROFESSIONAL PEOPLE IN GROUPS 1, 2,
AND 3 CONCERNING THE TYPES OF INSTRUCTION DEALING
WITH ELECTRICITY THAT THE RURAL PEOPLE
SHOULD HAVE

Group	Opinions of Professional People			
	Question 6		Question 7	
	Yes	No	Yes	No
1	25	0	11	14
2	48	2	27	23
3	15	4	8	11
Totals	88	6	46	48

Eighty-eight of the ninety-four who answered this part of the questionnaire stated that they believed the rural people could learn to safely make minor electrical installations. Of those who answered "no" to this question, two were in Group 2 and four were in Group 3.

However, only forty-six of the professional people who answered the questions in this part of the questionnaire believed that these rural people could learn to safely make major electrical installations. Of those who answered "yes" to this question, twenty-seven were in Group 2, and eight were in Group 3.

In considering these data, it is apparent that most of

the professional people who answered this questionnaire believed the rural people could learn to safely make minor electrical installations but could not learn to safely make major electrical installations. Apparently, they believed the major electrical installations would be too technical to teach to most of the rural people and these jobs could be done more safely and cheaply by experienced electricians.

The next part of the questionnaire deals with agencies which are already set up and equipped in the North Texas area to give instruction in the use of electricity and electrical equipment. The following question was asked of each of the professional people included in this study:

8. Are any agencies set up and equipped in your community to give instructions in the use of electricity and electrical equipment?
 Yes _____ No _____

Of the professional people who answered this question, six of the twenty-five in Group 1, nine of the fifty in Group 2, and four of the nineteen in Group 3, a total of nineteen, answered "yes" to this question. However, of those who answered "yes" to this question, one qualified his answer with the statement "physics department of high school and junior college." Other qualifying statements obtained from the questionnaire were: "G.I. School and vocational agriculture department of high school;" "not adequate;" "much information may be obtained from dealers;"

"R. E. A. is only one."

Table 8 presents the data obtained from this part of the study.

TABLE 8

THE ANSWERS RECEIVED FROM THE PROFESSIONAL PEOPLE IN
GROUPS 1, 2, AND 3 CONCERNING THE AGENCIES SET UP
AND EQUIPPED IN THE NORTH TEXAS AREA TO GIVE
INSTRUCTION IN THE USE OF ELECTRICITY AND
ELECTRICAL EQUIPMENT

Group	Opinions of professional people on question 8	
	Yes	No
1	6	19
2	9	41
3	4	15

The fourth and last part of this questionnaire concerns whether or not instruction dealing with the use of electricity and electrical equipment should be given if a need is found to exist among the men, women, boys, and girls living on electrified farms in the North Texas area, and, if a need is found to exist, whether or not the public high schools should include this instruction as a part of their curricula. The questions included in this part of the questionnaire follow.

9. If, in your opinion, a need does exist among the men, women, boys, and girls living on electrified farms for instruction dealing with the use of electricity and electrical equipment, should instruction be given to fill the indicated need? Yes____No____

10. If the answer to question number nine is "yes", should the public high school assume this responsibility? Yes____NO____

11. In the light of the philosophy and objectives of the public schools of Texas, do you believe instruction dealing with the use of electricity and electrical equipment should be included in the school program of your public high school? Yes____No____

The data collected from the professional people in Groups 1, 2, and 3 in regard to their opinions on these questions are found in Table 9.

TABLE 9

THE OPINIONS OF NINETY-FOUR PROFESSIONAL PEOPLE IN GROUPS 1, 2, AND 3 CONCERNING WHETHER OR NOT A NEED DOES EXIST AMONG THE MEN, WOMEN, BOYS, AND GIRLS LIVING ON ELECTRIFIED FARMS IN THE NORTH TEXAS AREA FOR INSTRUCTION DEALING WITH THE USE OF ELECTRICITY AND ELECTRICAL EQUIPMENT AND, IF SO, WHO SHOULD BE RESPONSIBLE FOR GIVING THIS INSTRUCTION

Group	Opinions of Professional People					
	Question 9		Question 10		Question 11	
	Yes	No	Yes	No	Yes	No
1	25	0	18	7	21	4
2	50	0	37	13	45	5
3	19	0	15	4	17	2
Totals	94	0	70	24	83	11
Percent- ages	100		74.4	25.6	88.2	11.8

All of the professional people who answered this questionnaire believed that if a need was found to exist among the men, women, boys, and girls living on electrified farms

for instruction dealing with the use of electricity and electrical equipment, instruction should be given to fill the indicated need.

However, only seventy out of ninety-four answered "yes" to the question concerning the responsibility of the public high school to take care of any needs found to exist among the rural people of North Texas. Eighteen of the twenty-five in Group 1, thirty-seven of the fifty in Group 2, and fifteen of the nineteen in Group 3 answered "yes" to this question.

Eighty-four of the ninety-four who answered the questionnaires believed that, according to the philosophy and objectives of the public schools of Texas, instruction dealing with the use of electricity and electrical equipment should be included as a part of the school programs of our public high schools. Of those who answered "no" to this question, four were in Group 1, five were in Group 2, and two were in Group 3.

In considering these data, it is pertinent to note the disparity existing between the answers received to questions 10 and 11. Whereas more than seventy-four per cent of the professional people who answered the questionnaire believed the public high schools should assume the responsibility to fulfill any indicated needs found to exist among the rural people in regard to instruction dealing with the use of electricity, more than eighty-eight per cent believed that,

according to the philosophy and objectives of the public schools of Texas, this instruction should be included as a part of the curricula of the public high schools.

The professional people of the North Texas area who answered this questionnaire, by their replies to the different questions concerning the use of electricity and electrical equipment, have shown that they believe that this instruction would help the rural people living on electrified farms in the North Texas area but this instruction should not include the making of major electrical installations. They have also shown that they believe a few agencies are set up and equipped in the communities surveyed to give instruction dealing with the use of electricity and electrical equipment, but there is an indication that these agencies are schools for veterans, agriculture farm shops, and rural electric co-operatives. A large majority of those who answered the questionnaire believe the public high schools should include instruction dealing with the use of electricity as a part of the curricula of the public high schools.

CHAPTER IV

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

This study shows three things: (1) a precedent for the expenditure of public funds to teach electricity in our public high schools has already been established by the school systems in the larger school systems of Texas, (2) the rural families living on electrified farms in the North Texas area want instruction of this type given to the boys and girls in their communities, and (3) both the rural people and the professional people of the North Texas area believe that instruction dealing with the use of electricity and electrical equipment should be included as a part of the curricula of our public high schools.

Although the use of electricity and electrical equipment had spread until by 1935 more than twenty-one million homes, about eighty per cent of the total in America at that time, were electrified, only eleven American farms out of every 100 had central-station electricity. More than five million American farms lacked electric service.

With the passage of the Rural Electrification Act of 1936 electric service spread until, at the end of 1946,

about fifty-seven per cent of the rural homes of America had electric service.

At the end of 1945 there were 144, 350 electrified farms in Texas with central-station service, or 37.6 per cent of all farms. The distribution of this saturation over the state is estimated to vary from 11.5 per cent in the Big Bend area to 74.7 per cent in the El Paso area. It is estimated that by 1965 the number of central-station farm customers in Texas will increase to 273,000 or 72.2 per cent of all the farms in Texas.

This rapid spread of the use of electricity will pose many problems for the people living in the rural areas of this state. For example: How can they prepare to use existing electrical facilities to the best advantage and still be prepared to take care of any future needs? Do these people know how to purchase that electrical equipment that is best suited to perform the work for which it is bought? Would the additional use of electrical farm equipment benefit these people, give them more leisure time, raise their income, and enable them to purchase more of the necessities of life?

The rural people realize that they know little or nothing about the proper use of electrical power and are anxious for their sons and daughters to learn to use it to its fullest advantage.

Both the rural people and the professional people surveyed in this study believe the spread of more knowledge of the proper use of electricity and electrical equipment is an educational problem and that the public high schools of Texas should assume the responsibility for fulfilling any indicated needs.

Conclusions

- I. The rural people interviewed in this study wanted
 1. The boys in their communities to receive instruction dealing with the proper use of electricity and electrical equipment encountered both inside and outside the farm home.
 2. The girls in their communities to receive instruction dealing with the types of electrical work encountered both inside and outside the farm home.
 3. The public high school to give this instruction.
- II. The professional people covered by this study believed instruction dealing with the use of electricity and electrical equipment on the farm would aid the rural families as follows:
 1. Help them use existing electrical facilities more intelligently.
 2. Help them purchase that electrical equipment which is best suited to perform the jobs for

which it is bought.

3. Instruction of this type would aid these people in making minor electrical installations and repairs that now have to be done by certified electricians.
4. This instruction for the boys and girls of each community would tend to
 - a. Give these rural families more leisure time
 - b. Raise their income
 - c. Enable them to purchase more of the necessities of life.

III. Although it is found, according to the answers received from the questionnaires sent to the professional people in the North Texas area, that some agencies are set up and equipped in some of the communities of this area to give instruction in the use of electricity and electrical equipment, it is the opinion of this study that these agencies are, for the most part, schools for veterans, vocational agriculture farm shops, and rural electric co-operatives which are, in most cases, inadequately staffed and equipped to give the boys and girls sufficient instruction to help them materially in their

work on the farm. Then, too, the ability of vocational teachers to teach the children in our public high schools is questioned because these teachers are trained to give the technical training peculiar to their vocations only and are not familiar with the techniques of general education.

IV. The professional people of the North Texas area believed

1. A need does exist in the North Texas area for instruction dealing with the use of electricity and electrical equipment
2. According to the philosophy and objectives of the public schools of Texas, instruction dealing with the use of electricity and electrical equipment should be included as a part of the curricula of our public high schools.

Recommendations

From the results of this study the writer makes the following recommendations:

1. That another study should be made to determine if the teachers of science, agriculture, home economics, and industrial arts in the public high schools of the North Texas area have been given the proper teacher-training in our colleges and universities to be able to properly

teach those phases of the use of electricity and electrical equipment that fall within their fields of teaching.

2. That another study should be made to determine if instruction dealing with the proper use of electricity and electrical equipment should be taught as a separate course in the high schools of this state or should be included as a part only of the high school courses in science, agriculture, home economics, and industrial arts.

3. That another study should be made to determine if there should be any difference in a high school course in electricity for boys and girls living in the rural areas of Texas and those living in the cities.

4. That another study should be made to determine what should be included in a high school course of study dealing with the uses of electricity and electrical equipment peculiar to the farm needs in the North Texas area.

APPENDIX

Dear Sir or Madam:

I am conducting a survey to determine if instruction dealing with the use of electricity and electrical equipment is needed and wanted by the families living on electrified farms in the North Texas area and, if so, should the public high schools include this instruction as a part of their curricula.

I shall appreciate it if you, or someone you might designate, will fill out the enclosed questionnaire and return it to me as soon as possible with such recommendations and remarks as you see fit to make.

No names of individuals or institutions will be used in reporting the findings of this survey.

Sincerely,

Charles S. Greathouse

QUESTIONNAIRE

We are conducting a survey to determine the educational needs of boys and girls living on electrified farms in the North Texas area. Please place a check mark () after the appropriate answer for each question.

1. Would instruction dealing with the use of electricity and electrical equipment aid the people in the rural areas surrounding your home to use existing electrical facilities more intelligently? Yes_____No_____

2. Would instruction dealing with the use of electricity and electrical equipment help the people in the rural areas surrounding your home to purchase that electrical equipment that is best suited to perform the jobs for which it is bought? Yes_____No_____

3. Would the additional use of electrical farm equipment give the people in the rural areas more leisure time? Yes_____No_____

4. Would the additional use of electrical farm equipment by the people in the rural areas surrounding your home raise their income and enable them to purchase more of the necessities of life? Yes_____No_____

5. Would instruction dealing with the intelligent use of electricity and electrical equipment benefit the people in the rural areas surrounding your home? Yes_____No_____

6. Would instruction dealing with the use of electricity and electrical equipment aid the people in the rural areas surrounding your home in safely making minor installations and repairs that are now done by certified electricians? Yes_____No_____

7. Would instruction dealing with the use of electricity and electrical equipment aid the people in the rural areas surrounding your home in safely making major electrical installations and repairs that now have to be done by certified electricians? Yes_____No_____

8. Are any agencies set up and equipped in your community to give instruction in the use of electricity and

electrical equipment? Yes_____No_____

9. If, in your opinion, a need does exist among the men, women, boys, and girls living on electrified farms for instruction dealing with the use of electricity and electrical equipment, should instruction be given to fill the indicated need? Yes_____No_____

10. If the answer to question number nine is "yes", should the public high school assume this responsibility? Yes_____No_____

11. In the light of the philosophy and objectives of the public schools of Texas, do you believe instruction dealing with the use of electricity and electrical equipment should be included in the school program of your public high school? Yes_____No_____

Types of electrical work performed by rural people who use electricity	Have you encountered trouble in doing this type of work?		Do you want instruction in this type of work given to the boys and girls in your community?				Do you think this instruction should be given by the public high school?	
	Yes	No	Boys		Girls		Yes	No
			Yes	No	Yes	No		
9. Locate and eliminate the causes of blown fuses.								
10. Determine whether or not it would be profitable to buy electrical equipment.								
11. Plan the wiring of a building.								
12. Select and purchase non-household electrical equipment.								
13. Operate and care for non-household electrical equipment.								
14. Estimate the cost of operating non-household electrical equipment.								
15. Make simple repairs on non-household electrical equipment.								

Types of electrical work performed by rural people who use electricity.	Have you encountered trouble in doing this type of work?		Do you want instruction in this type of work given to the boys and girls in your community?				Do you think this instruction should be given by the public high school?	
	Yes	No	Boys		Girls		Yes	No
			Yes	No	Yes	No		
16. Change hand-operated machines to power-operated machines.								
17. Rig up a portable motor.								
18. Install new lighting or convenience outlets and switches.								
19. Install a new circuit in a building.								
20. Wire a building for electricity.								
21. Do special wiring required in stalling electrical equipment.								

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