

AGRICULTURAL EXPERIMENT STATION

KANSAS STATE COLLEGE OF AGRICULTURE
AND APPLIED SCIENCE

MANHATTAN, KANSAS

DEPARTMENT OF AGRICULTURAL ECONOMICS

KANSAS RURAL INSTITUTIONS:

II. A PIONEER IN RURAL ELECTRIFICATION¹

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This is a discussion of an instance in which members of a small rural community met an important community need through their own efforts and with marked satisfaction. The need was for improved lighting facilities primarily and for other

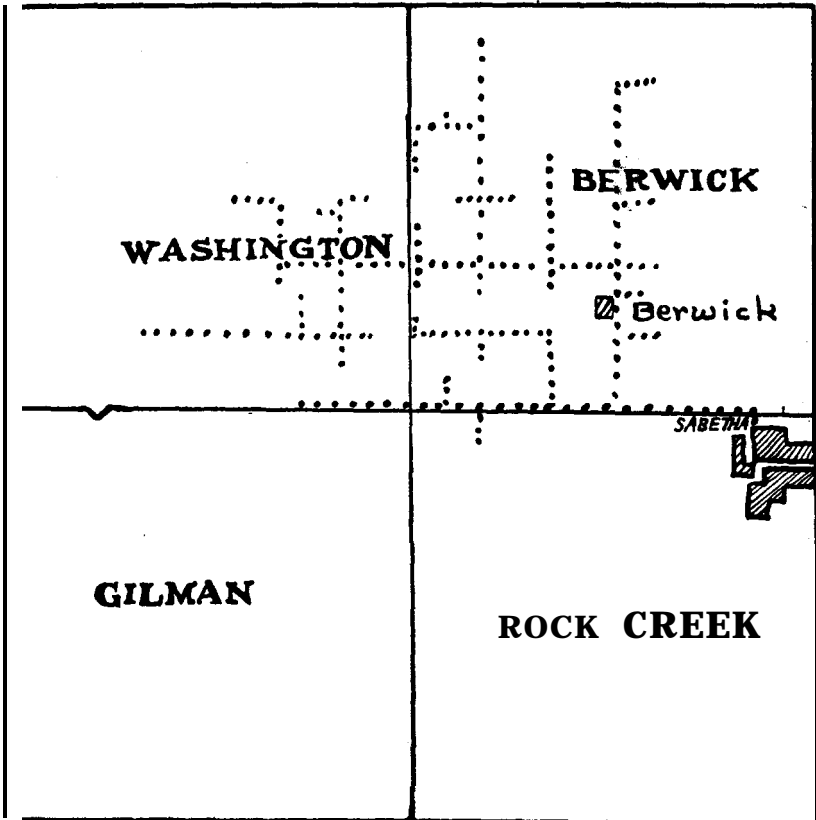


Figure 1. Location of distribution system serving parts of four Nemaha County townships in 1945.

¹Contribution No. 136. Department of Agricultural Economics.

electrical facilities secondarily. It was met in an impressively simple way through the exercise of self-reliance, thrift, industry, good sense, and mutual faith. Throughout a quarter-century the rural community has had an efficient and constantly improving rural electrification service through the operations of a farmers' cooperative association at Berwick in the northeastern corner of Nemaha County, Kansas. The location in the county's northeastern townships is shown in figure 1.

The association was organized on April 14, 1919. On that day 48 farmers who had subscribed for 48 shares of stock in the proposed enterprise met under the chairmanship of Mr. A. F. Grote and elected a board of directors composed of E. T. Ukele, Adolph Lortscher, A. B. Lanning, Norman Fike, and Mathias Strahm. Later the same day the directors elected Mr. Ukele president, Mr. Strahm secretary, and Mr. Lanning treasurer, and voted to incorporate under the laws of Kansas. These acts marked the official beginning of the subject of the study here reported upon, a cooperative which since May 19, 1919, has been known as the Berwick Transmission Line Company and which in this report is referred to hereafter simply as the Company.

INITIAL OBSTACLES

This Company was a pioneer in rural electrification in Kansas. At the time of its organization the total number of Kansas farms using centrally generated electric energy can hardly have exceeded 500. (Five years later, in 1924, there were only 900 such farms in the state.²) The electrified farms were distributed widely, throughout the state, a few here and a few there, often adjacent to towns where the electrical distribution systems had been cautiously extended a mile or so into the countryside. There was widespread skepticism, both among producers and distributors of electric energy and among farmers, regarding the feasibility of rural electrification. There was also widespread lack of adequate knowledge of the subject.

Any project for electrifying a rural community faced, not only these obstacles but also a difficult dilemma. If the rates charged for electric energy were high enough to make it clearly feasible financially to serve the few exceptional farmers who would and could pay for the service, they were so high as to repel all but these exceptional farmers. If they were sufficiently low to attract the generality of farmers in the community, there was apprehension that they would not be feasible financially. Rates, it seemed, must be high until the use of electricity increased sufficiently to justify their reduction. Use of electricity, it seemed, would not increase until rates were reduced. This situation called for some bold pioneering, some taking of special risks, both by producers and distributors of electricity and by

²H. B. Walker: "Present Status of Rural Electrification in Kansas," Kansas State College, Engineering Experiment Station, Bulletin 16, 1926. Throughout the remainder of this paper all references to Walker relate to the bulletin here cited.

consumers. It is as a distributor and as a group of consumers that the Berwick Transmission Line Company effectively pioneered.

Fortunately there were a few other pioneers in the state, both producers and distributors of electricity and individuals and groups of consumers. Thanks largely to the imagination, faith, courage, and performance of these pioneers, Kansas now has approximately 40,000 electrified farms, and the number is increasing rapidly. The skepticism of a quarter-century ago has vanished. The work of the pioneers--producers, distributors, and consumers--has borne abundant fruit.

THE DISTRIBUTION SYSTEM

As the study here reported upon was concerned with the Company's economic and social features, rather than its engineering features, only brief mention will be made of the distribution system.

Electricity is purchased from the municipally owned generating plant at Sabetha. The Company's line connects with the municipal distribution system at the city limits. The Company owns and operates the distribution system from that point to points on the public highways adjacent to the lands occupied by the stockholders. Each stockholder provides and maintains wire, poles, transformers, hardware, and other materials needed to connect with the transmission line at the adjacent public highway and to distribute the electricity on his own premises.

By March 6, 1920, a total of 27.75 miles of transmission line had been completed, at a cost of approximately \$660 a mile. Since that date, the line has been extended from time to time so that on December 24, 1945, its total length as reported by the president of the Company was 51.5 miles. The condition of the line as observed in the summer and autumn of 1946, together with the Company's quarter-century of favorable experience in relation to weather damage, claims for indemnity, the attitude of stockholders, and other factors, clearly evidences substantial construction and adequate maintenance.

THE AGRICULTURE OF THE DISTRICT

The area served by the Company lies chiefly within two townships, Berwick and Washington. By regarding these two townships as sufficiently representative of the district and using data provided by the Kansas State Board of Agriculture, it is possible to give a brief description of the agriculture of the district. By the use of round numbers applying to 1939, the last pre-war year, such a description is given below.

The two townships contain a few more than 200 farms. In size the farms average about 200 acres. Almost half the farms contain 80 to 160 acres each and about three-fourths contain 80 to 240 acres each. There are few farms of less than 80 acres or more than 320 acres.

About one-fourth the farm land is planted to corn and only half as much is planted to wheat. The combined acreage of pasture and alfalfa is equal to that of corn. Hence about half the farm land is devoted to corn, alfalfa, and pasture. This means livestock. More than half the farmers fatten beef cattle, more than three-fourths produce hogs, and nearly all keep milk cows and chickens. Even this brief description is sufficient to suggest the high quality of the agriculture of the district.

It was ascertained in 1945 that three-fourths of the farms belonging to members of the Company are operated by their owners, one-half the remainder by sons of owners, the other half by other tenants.

THE PEOPLE OF THE DISTRICT

The population averages five persons per farm. In ancestral nationality, most of it one or more generations removed, the people are Northern European. German and Swiss predominate, but there are also Scandinavian, British, and Irish. The community supports churches of several denominations, whose tenets and religious practices vary widely. No dominant influence based on either church affiliation or ancestral nationality appears to exist. The people are simply American and Christian.

The appearance of the farms, the type of farming, and the people themselves evidence sturdiness, industry, intelligence, self-reliance, and respect for the land. It is to be expected that such people would be progressive and successful, both as individuals and as a group.

To an extent unusual in many parts of Kansas, the people of northeastern Nemaha County are "cooperative minded". In addition to the Berwick Transmission Line Company, at least seven other farmers' cooperatives operate in that part of the county: a large creamery, a grain elevator, a second transmission line company, two R. E. A. electrical cooperatives, a produce company, and an oil dispensing company. No doubt the Company has both contributed to the local cooperative atmosphere and received benefits from it. Cooperation is more likely to be successful in a community where it is popular than in one where it is not.

Another important human factor noted in this study is the habit of the people to deal with a situation directly and simply. Directness and simplicity of procedure are pleasingly apparent in every phase of the enterprise under study. The Company appears to have been singularly free from the influence of the not uncommon kind of person who strives constantly to make simple things complicated.

PURCHASE OF ELECTRICITY

A persistent increase in the quantity of electric energy purchased by the Company is one of the evidences of the Company's success and of the general satisfaction of the stockholders. Dur-

ing the early years such an increase was clearly apparent and was reported by Walker, who presented the following data showing purchases by the Company in each of four successive years:

1921	26,000 KWH
1922	29,000 KWH
1923	32,000 KWH
1924	35,000 KWH

Walker observed that the increases were due chiefly to increased use by the members of the Company and not to increases in the number of members. That the increases have persisted since Walker reported is indicated by the following figures showing annual purchases at three successive decennial periods and in 1944:

1922	29,000 KWH
1932	68,000 KWH
1942	97,000 KWH
1944	117,600 KWH

These data are shown graphically in figure 2.

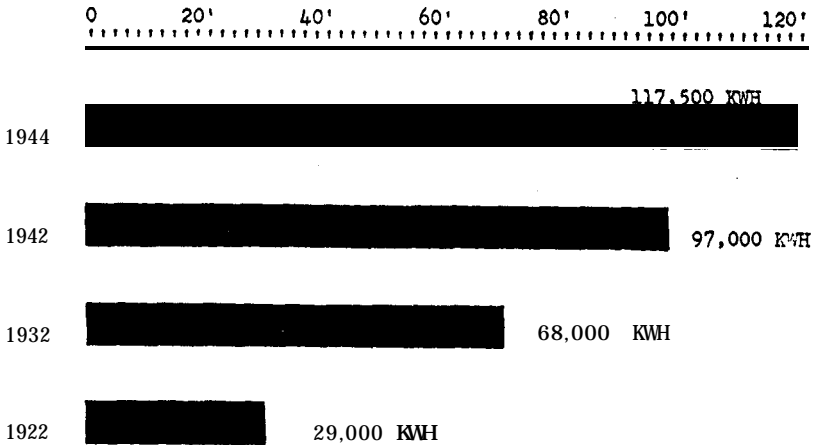


Figure 2. Electricity purchased by the Company in 1922, 1932, 1942, and 1944.

That these increases also were due chiefly to increased use by individual consumers and not to an increase in the number of consumers is indicated by the following figures showing the quantity of energy purchased by the Company per consumer in 1924 and 20 years later:

Year	Purchased by Company, KWH	Number of Consumers	Purchased per Consumer, KWH
1924	36,000	78	449
1944	117,500	113	1040

Figure 3 shows graphically for the same two years the quantity of electricity purchased, the number of miles of line, and the number of users. Figure 4 shows the purchases per user and per mile of line.

USES OF ELECTRICITY

It should be clearly understood that the electricity actually used by consumers was much less than the quantities indicated by the figures showing the Company's purchases. The quantity actually used was the quantity purchased by the Company at the Sabetha city limits less the transmission and transformer losses. Walker found these losses in 1921 to 1924, inclusive, to

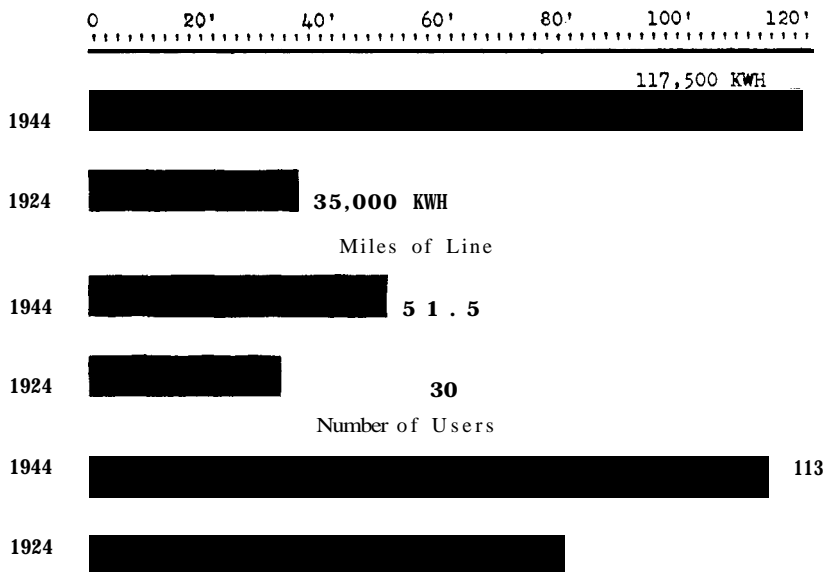


Figure 3. Electricity purchased, miles of transmission line, and number of users in 1924 and in 1944.

be approximately 50 per cent of the electricity purchased by the Company. With increased use and improvements in the distribution system these losses have been reduced to between 30 and 40 per cent. If a loss figure of 50 per cent is used for the early years and one of 40 per cent for the recent years, it may be computed that the average use per consumer was 225 KWH in 1924 and 624 KWH in 1944. The figures are equal respectively to 56 KWH and 156 KWH per quarter or to 19 KWH and 52 KWH per month. All these data show a marked increase in the use per consumer, and show that the increase in total energy purchased has been caused chiefly by this increased use and not by enlargement of the membership.

Originally, in the Berwick community electrification was thought of almost exclusively in terms of electric light. In the early days of the Company, as the records indicate, members regularly spoke of electrification and even of electricity as "the lights". After a quarter-century of experience of electrification, members still often speak the same way. It appears that in the

pre-electrification days the desire for light exceeded all other desires related to the electrification of the community. "Let there be light" expressed the dominant attitude of the founders of the Company and it still expresses a large portion of the local interest in electrification. This helps to explain why lights—house lights—are the only electrical appliances used by all members of the Company, both in 1945 and 25 years earlier.

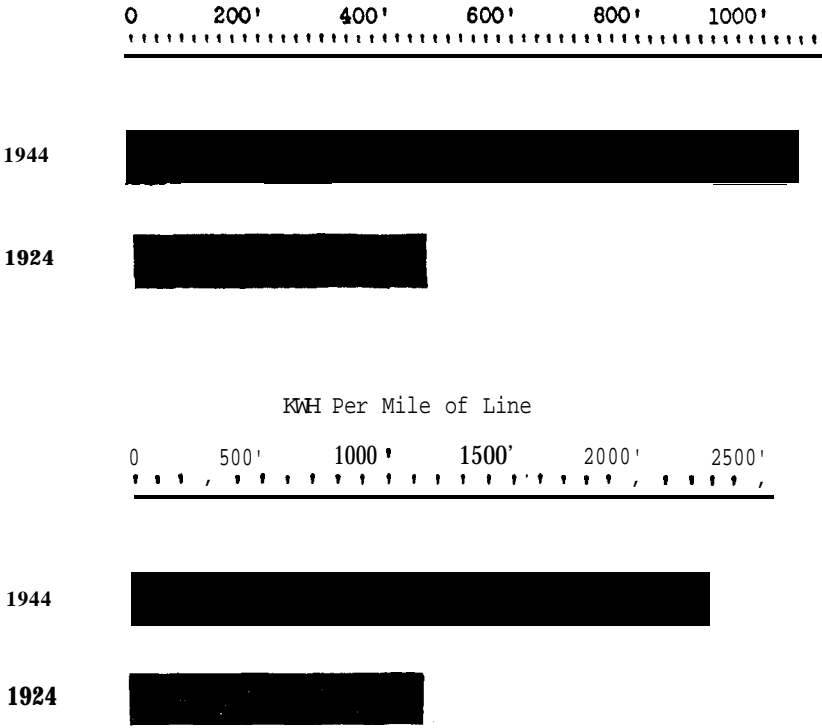


Figure 4. Electricity purchased per user and per mile of transmission line in 1924 and in 1944.

Data obtained in 1945 from 99 of the farms served by the Company show that in the aggregate these farms were using 72 electrical appliances. The number of appliances in use ranged from 4 on each of two farms to 32 on one farm. The average number was 15 per farm. That the number varied somewhat with farm tenure in 1945 is indicated in table 1.

Perhaps the significant facts shown by these figures are that owners and the sons of owners had the same average, and that tenants unrelated to owners were not so far behind as is usually expected.

Thirty-one of the 72 electrical appliances found on the 99 farms in 1945 and the percentage of farmers using each kind are indicated in table 2. Each of the remaining 41 appliances

in use by members of the Company in 1945 was in use on fewer than 10 per cent of the farms. These 41 appliances are cooking range, ventilating fan, grain elevator, clipper, churn, curling iron, welder, house water heater, other water heater, roaster, door bells, heat lamp, ultra-violet lamp, dish washer, sun lamp, air compressor, emery grinder, corn popper, battery charger,

TABLE 1. FARM TENURE AND USE OF ELECTRICAL APPLIANCES.

Farms Operated by—				
	Owners	Sons of Owners	Other Tenants	All Farms
Number of farms	73	13	13	99
Number of electrical appliances in use:				
Highest on any farm	32	22	19	32
Lowest on any farm	4	11	4	4
Average	16	16	10	15

corn crib lights, hog house lights, wood saw, quick freezer, incubator, mangle, paint sprayer, hoist, stoker, furnace blower, burner control, jig saw, rotary drill, moisture tester, beverage cooler, gasoline pump, portable motor, milk house lights, infant bottle warmer, forge, trip hammer, thermostat.

As already indicated, the original desire for rural electrification was based on a desire for lights, particularly for the farm home. This desire is for home improvement rather than for increased income. In the early days of rural electrification, major emphasis--sometimes exclusive emphasis--was placed on the home improvement aspects. It was contended that rural electrification was warranted by its direct effects upon the living conditions in the farm home. And so, in the early stages, electrification brought house lights, washing machines, and other household conveniences and comforts. Later, appliances of direct importance in relation to income began to be added, appliances used directly in the money-making enterprises of the farm: cream separators, shop motors, chick brooders, electric fence.

An examination of the list of 72 electrical appliances found on the 99 farms in 1945 discloses that approximately one-half the appliances are used primarily for home improvement and one-half for the purpose of increasing financial income. Such a balance between appliances used in earning a livelihood and those used in enriching farm life augurs well for the future of rural electrification and of rural life.

Comparison with 1925—In 1925, Walker reported the results of a detailed survey of 324 of the 900 electrified farms in the state at that time. Some interesting comparisons may be made

between the uses of electric energy on those 324 farms situated in 28 counties of the state in 1925 and the corresponding uses on 99 of the farms in the present study of 1945. Walker found a total of 37 kinds of electrical appliances. The present study has disclosed a total of 72, or almost twice as many in 1945 on 99 farms in one corner of one county as were found on more than three times as many farms in 28 counties 20 years earlier. A comparison of the percentages of farms using specified appliances in 1945 and in 1925 is made in table 2 and shown graphically in figures 5, 6 and 7:

TABLE 2. PERCENTAGES OF FARMS USING SPECIFIED APPLIANCES.

Rank in 1945	Appliances	1945 (99 farms) Per Cent	1925 (324 farms) Per Cent
1	House lights	100	100
2	Washing machine.....	97	68
3	Iron.....	94	91
4	Barn lights.....	87	70
5	Yard lights.....	85	47
6	Refrigerator	83	3
7	Radio.....	78	None
8	Cream separator.....	65	16
9	Garage lights.....	53	40
10	Fan.....	51	28
11	Vacuum cleaner.....	50	39
12	House pump.....	50	71
13	Toaster.....	50	29
14	Shop motor.....	45	11
15	Poultry house lights.....	43	17
16	Sewing machine.....	40	5
17	"Other lights".....	37	42
18	Waffle iron.....	37	None
19	Electric fence.....	35	None
20	"Other pump".....	33	32
21	Clock.....	30	None
22	Brooder.....	26	2
23	Heating pad.....	26	None
24	Mixer (for kitchen.).....	23	None
25	Razor.....	22	None
26	Grain cleaner.....	21	2
27	Hot plate.....	19	None
28	Soldering iron.....	16	None
29	Percolator.....	13	8
30	Milking machine.....	13	5
31	Room heater.....	12	8

All other electrical appliances found in the two studies were in use on fewer than 10 per cent of the electrified farms considered. On the 99 farms considered in 1945 there were 39 appliances not found on the 324 farms studied in 1925. Of the 37 appliances found on the 324 farms in 1925, all but four were also found on the 99 farms in 1945.

The above comparison suggests impressively the marked advances made during the 20-year period in the availability and use of electrical appliances for the farm and the farm home.

FINANCIAL ARRANGEMENTS AND EXPERIENCE

The Company's financial arrangements have always been simple and direct. They are based on principles of self help and mutual help. They reflect the determination of the members to stand on their own feet and to make the Company useful and successful through the pooling of the contributions of the members: The Company's quarter-century of financial experience has validated the principles on which the founders acted.

PERCENTAGE OF FARMS USING SPECIFIED APPLIANCES

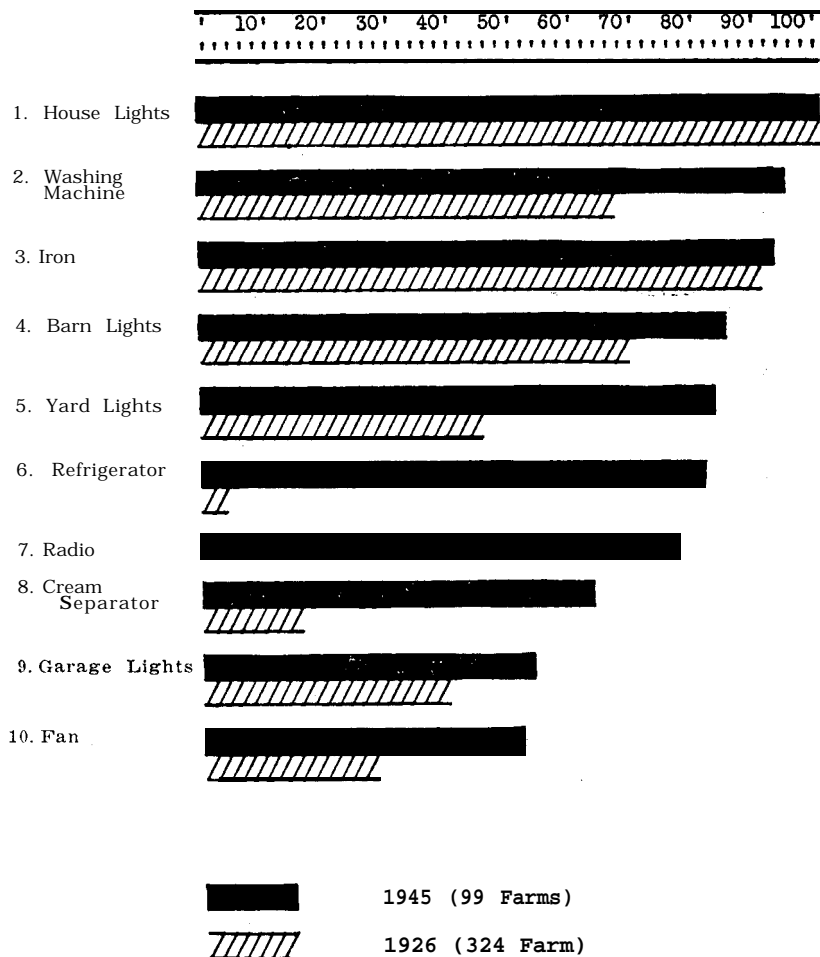


Figure 5. Percentage of farms using each of the ten most widely used electrical devices in 1945, with comparisons with 1925.

Capitalization.--On May 19, 1919, the Board of Directors formally decided on a capitalization of \$25,000 to be represented by 100 shares at \$250 each, a price which had been fixed by the directors at a meeting held on April 21, 1919. On September 17, 1945, the directors voted to increase the capitalization to \$35,000. This capitalization will provide for 140 shares at \$250 each.

PERCENTAGE OF FARMS USING SPECIFIED APPLIANCES

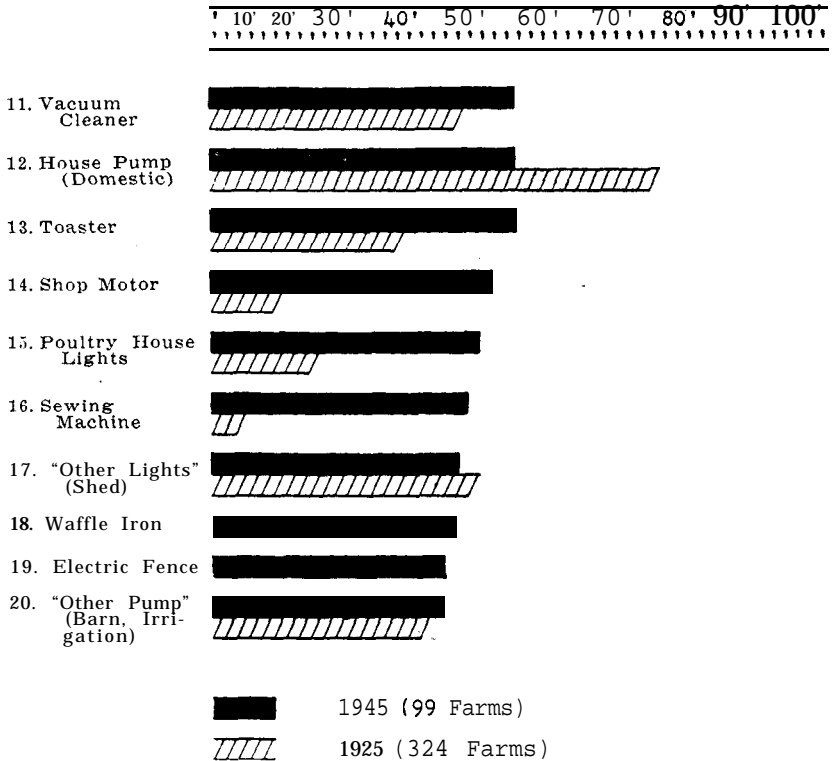


Figure 6. Percentage of farms using each member of the second ranking group of electrical devices in 1945, with comparisons with 1925.

From the beginning, the Company's major expenditures for the construction of the transmission line have come ultimately from the receipts from the sale of shares to members. Each farm owner who uses the service is required to purchase one share of stock. A farm owner who has two or more farms receiving the service must purchase one share of stock for each such farm. Schools and churches adjacent to the line may obtain the service by the payment of an attachment fee of \$10 and a rate for electric current determined by the directors. Special arrangements also are made for farm tenants. The by-laws, as amended, pro-

vide that stock attaches to the farm so that when a farm is sold the share of stock is transferred to the buyer.

Use of Credit.--Not all the stockholders have been able to pay promptly and in full the price charged for the stock. This fact has sometimes made it necessary to resort to borrowing to prevent undesirable delays in the progress of the enterprise.

PERCENTAGE OF FARMS USING SPECIFIED APPLIANCES

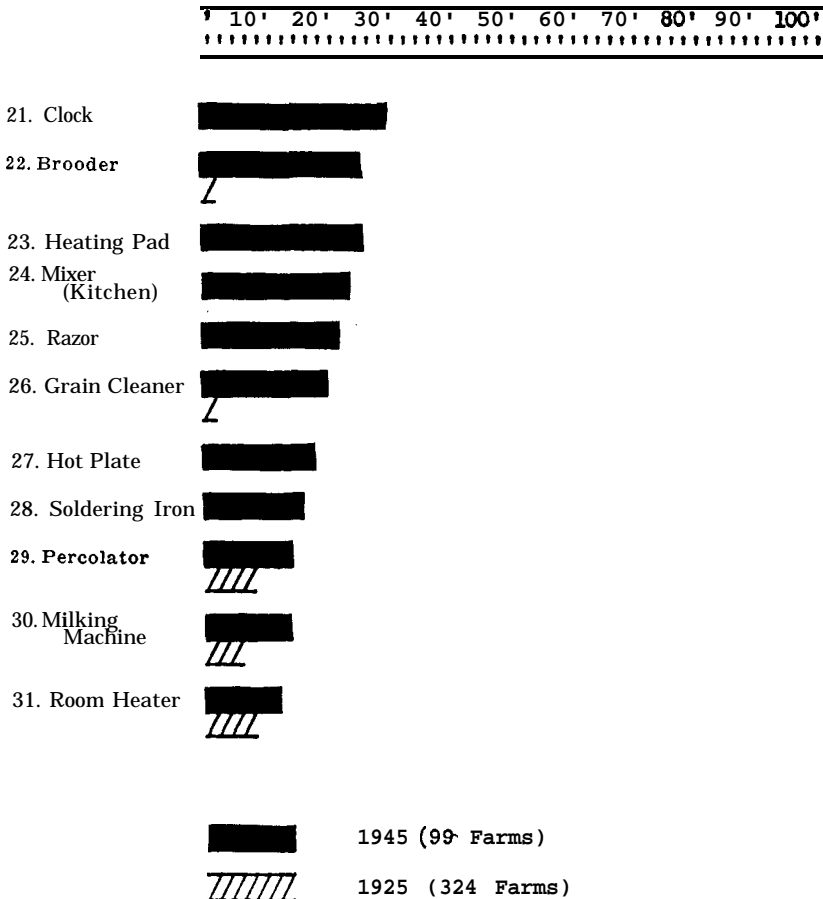


Figure 7. Percentage of farms using each member of the third ranking group of electrical devices in 1945, with comparisons with 1925.

As early as October 13, 1919, the directors foresaw this necessity and voted "to borrow money if necessary to pay bills". In the beginning, rural electrification was so new and so little understood in the community and its financial feasibility was so lacking in local proof that the credit agencies of the community

did not feel warranted in extending credit to the Company. This problem was met through the generosity, faith, and public spirit of two comparatively well-to-do stockholders who signed notes personally to cover the first borrowing. In due course, stockholders became able to pay for their shares and the notes were repaid without loss to anybody. Subsequently, on several occasions varying sums were borrowed from the local bank. For example, the financial statement of January 7, 1921, shows a bank loan of \$2,000 and that of October 10, 1922, shows the liquidation of this loan and the payment of \$142.32 as interest. The statement of October 4, 1924, shows that the Company owned a certificate of deposit for \$624, indicating that a surplus was beginning to accumulate.

Financial Reserve.--In recent years, the Company has carried a reserve sufficient to take care of any probable financial contingency. At the annual meeting held on October 4, 1924, the stockholders voted to set up a reserve fund of \$2,000 to be used for "rebuilding and repairing" and to be built up as surplus funds accumulated beyond a \$300 operating fund. This reserve, together with additional surplus accumulations, has been ample. By September 30, 1945, the fund available for contingencies and operation was approximately \$5,000.

Sources of Income.--Aside from occasional small receipts as interest on bonds owned and from miscellaneous sources, the Company has three sources of income: charges for electricity used, transformer charges and, occasionally, the sale of stock to new members and special "hook up" charges. These have been sufficient to keep the organization in a sound financial condition. (Some electrical merchandise is purchased by the Company on orders from members, but, as it is handled at cost and paid for by members in advance, the money involved is merely a revolving fund.)

Rates Charged for Electricity.--The rates charged for current must be sufficient to provide an income which, when supplemented by transformer charges, will be sufficient to pay for the current purchased from the Sabetha generating station, to cover the cost of operating and maintaining the transmission line, and to absorb the transmission losses. In the beginning these rates necessarily were high. Walker reported that in 1925 the rates charged members were nine cents a kilowatt-hour for "lighting and household uses" and seven cents a kilowatt hour for power. As the volume of use increased, the unit cost to the Company of the energy purchased and of its distribution declined, and the rates charged members were reduced from time to time. In 1945, the rates per kilowatt hour were as follows:

Where two meters were used:

For lighting	6 cents
For power and heating	4 cents

Where only one meter was used:

For the first 60 KWH per quarter	6 cents
For energy in excess of 60 KWH per quarter.....	4 cents

As indicated elsewhere in this report, the computed average quantity of energy used in 1944 was 156 KWH per quarter per user. Where one meter was used and the first 60 KWH charged for at 6 cents, the remainder at 4 cents, and the transformer charges added, the cost to the consumer averaged \$9.44 a quarter, or 6 cents a KWH. The corresponding figures for 1924 are 56 KWH per quarter per user and the average cost to the consumer \$8.04 a quarter, or 14.4 cents a KWH. These figures emphasize the importance of the quantity of energy used in relation to the rates it is necessary to charge and to the cost per KWH to the consumer. During the 20-year period, thanks mainly to increased use, the rates charged the consumer were reduced approximately 50 per cent, and the consumer's average cost per KWH declined about 58 per cent. Further marked increases in use will make possible still lower rates and lower average costs per unit of energy.

Transformer Charges.—The sums charged users to offset transformer losses have been changed from time to time during the past 20 years. The following figures, expressing the charges per quarter, summarize the changes:

	Charges Fixed October 2, 1924	Charges in effect in October, 1945
For a 1.5 KVA Transformer	\$3.00	\$2.00
For a 3 KVA Transformer	4.00	3.00

These figures show a marked reduction in transformer charges: 33 1/3 per cent for the smaller transformers and 25 per cent for the larger ones.

Delinquency in Payment of Bills.—The records of the Company show that there have been recurring difficulties with members who did not always pay promptly for the Company's services. Something of the extent of these difficulties is suggested by the figures in table 3 showing delinquencies at the close of each of five fiscal years ending on September 30 of the years indicated :

TABLE 3. DELINQUENCIES AT THE CLOSE OF EACH OF FIVE FISCAL YEARS.

Year	Number Delinquent	Amount of Delinquency		
		Total	Highest	Average
1931	28	\$491.98	\$75.20	\$17.57
1932	31	297.07	34.63	9.58
1934	38	423.25	42.16	11.14
1939	19	325.82	68.46	17.15
1941	13	178.11	64.10	13.70

It should be noted that bills are rendered quarterly and that, as voted by the stockholders on January 7, 1921, they become delinquent 15 days after they are rendered. This arrangement is distinctly liberal toward the members. The charge for current used on July 1, for example, is not billed until three months later and it does not become delinquent until 15 days still later.

It will be noted from the above table that, as is to be expected, more members were delinquent during the early 1930's, a period of economic depression, than in 1939 and 1941, years of comparative prosperity. A significant fact not shown in the table is that, as is also to be expected, there was a tendency for the same individuals to be delinquent year after year. This is indicated by the delinquency records of two members, Mr. X and Mr. Y, during the five years included in the above table. Their delinquencies on September 30 of each of the five years are shown in table 4.

TABLE 4. DELINQUENCIES OF TWO MEMBERS AT THE CLOSE OF EACH OF FIVE FISCAL YEARS.

Y e a r	Mr. X	Mr. Y
1931	\$29.34	\$75.20
1932	None	9.32
1934	33.36	42.16
1939	35.96	68.46
1941	64.10	None

There is little if any correlation here between general economic conditions and delinquency. Comparison of these figures with those in the preceding table shows that the delinquency of Mr. X was the highest of all in 1941, and that of Mr. Y had that distinction in three of the five years. As is often true of financial delinquencies, those of members of the Company doubtless resulted predominantly from misfortune or from the slow-pay habit, or from both.

The Company has tried and still tries both penalties and rewards as means of reducing delinquency. The penalties are lenient and the rewards are generous. Both doubtless are in some degree effective. As early as January 7, 1921, the stockholders voted to disconnect any user who "refuses to pay his light bill" and to charge \$10 to reconnect. On November 4, 1923, the directors voted to give to any user who was six months delinquent 30 days notice and thereafter to disconnect if delinquency persisted. On October 9, 1924, they authorized the Treasurer to "try to collect the light bills". On December 30, 1924, they reaffirmed the stockholders' action on January 7, 1921, regarding six-months delinquency and 30 days notice of intention to disconnect. On April 6, 1937, the directors reaffirmed the by-law

providing that a member is responsible for the cost of the electricity used on his property. All these and similar acts indicate two things: the persistence of delinquency, on at least a small scale, and the understandable reluctance of the directors to "crack down" on their neighbors. There have been some, but not many, instances of disconnection of service.

The adoption by the Company of a reward for prompt payment of bills came later than the adoption of a penalty for delinquency, and now, the two are mutually supplementary. The reward is a 10-percent discount for payment within 10 days of the date of submittal of the bill. This certainly is a generous reward. It probably does more to induce prompt payment than does the penalty for delinquency, for the penalty is slow in taking effect and subject to some uncertainty of enforcement.

The use of both reward and penalty seems to be producing results which upon the whole are satisfactory. At any rate, the Company for years has been in a strong position financially. There is an element of injustice in the fact that those who pay promptly pull their own weight and also the weight of delinquents during periods of delinquency; but the Company as a whole has not suffered serious damage as a result of its policy. Ultimate losses from delinquency have been slight.

Expenditures.—A major continuing expense is that for the purchase of electricity. Other items cover the cost of maintaining and operating the transmission system and such minor expenses as insurance and taxes. Excesses of income over expenditure have enabled the Company to set aside gradually and to maintain a substantial reserve for contingencies and an adequate surplus to defray regular operating expense.

Rates Paid for Electricity.—In the beginning the rate paid for electricity at the city limits of Sabetha was a flat 4 1/2 cents a kilowatt-hour. As use increased the rate was reduced from time to time so that in 1945 electricity was purchased at the following rates per kilowatt-hour:

For the first 1500 KWH per month, 2 cents
All in excess of 1500 KWH per month, 1 1/2 cents

These rates represent a reduction of more than 50 per cent during the 25-year period. The annual cost of electricity purchased by the Company in recent years has fluctuated between \$1,500 and \$2,000, averaging \$1,705 a year for the five years ending September 30, 1945.

Line Maintenance and Operation.—The expense of keeping the distribution system in good order tends to increase with the age of the system. The rise of wages and of costs of materials in recent years has accentuated this tendency. Twenty years ago, when the system was new and the line was shorter than it is now, the annual cost of labor and materials for keeping it in repair seldom exceeded \$1,000. In the past five years the an-

nual cost, including insurance, has averaged a little more than \$1,900, or about \$200 above the average cost of electricity purchased by the Company during the same years. But the Company has acted wisely in its determination to keep the system in good working order, and to make renewals and replacements promptly when they are needed, so as to maintain satisfactory service.

Insurance.—The Company prudently carries liability insurance as protection against loss which might result from damage for which the Company might be held responsible. In the quarter-century there have been three cases of slight personal injury to Company employees, and these have been covered by the insurance. There has been no call during this period for indemnity for property damage. Writing in 1925, Walker said, "So far the Company has been fortunate in escaping storms of a damaging character". That good fortune appears to have persisted. But substantial construction and careful maintenance, as well as good fortune, are doubtless important factors. The annual cost of the liability insurance fluctuates around \$150. It is interesting that it was only \$4 more in 1945 than it was 20 years earlier, when the distribution system was considerably smaller. This fact reflects the insurance company's approval of the distribution system, the Company's favorable experience, and probably some downward revision of insurance rates generally.

Taxes.—As an organization, the Company pays no taxes except sales levies on what it sells to its members and social security taxes on its employees. These two amount to approximately \$100 a year. The property tax on the distribution system is paid by the stockholders, the owners of the property, each share of stock being assessed and taxed as personal property.

Miscellaneous Expenses.—Two continuing but minor expenses are those covering the reading of meters and the keeping of the accounts. Until recently it was customary for one of the stockholders to be employed to read the meters every three months and to record his findings on forms which serve as bills for charges. This service cost the Company around \$100 a year. On February 24, 1944, the directors added meter-reading to the duties of the line-maintenance man at a slight saving in cost. The Company's financial accounts are kept at a local bank, which serves as the Company's depository, by a bank employee for whose services the Company pays approximately \$100 a year.

The Company's expenditures would be substantially greater than they are and the rates charged for electricity probably would have to be higher than they are, but for the fact that members, particularly the directors, render much service without compensation, as indicated elsewhere in this report.

MANAGEMENT AND OPERATION

The Company is farmer-owned and farmer-managed. It has no officials who are not stockholders and it has no paid officials. Its by-laws provide that the board of five directors "shall have general supervision over the building of the line, fix the rate per kilowatt for light and power, see that the transmission line is kept in good repair, and have general supervision over all the affairs of the Company".

Unpaid Management.--The three officers--president, secretary, treasurer--are elected "from and by the board of directors", as the by-laws require. These officers and two other directors exercise the functions usually performed by paid officials in commercial organizations. If they were paid what their time is worth, their compensation might constitute excessive overhead expense in so small an organization. Their unpaid services are a major factor in the Company's success.

Continuity in Management.--The term of office of each director is five years. As only one directorship becomes vacant each year there is a fairly high degree of automatic continuity. The fact that directors commonly are re-elected at least once and sometimes more than once gives increased continuity. But each year at the annual meeting, the stockholders have an opportunity to bring in at least one new director.

It is noteworthy that one of the founders, Mr. E. T. Ukele, has served continuously as a member of the board of directors since April 14, 1919, and as president of the Company since the same day. On October 2, 1945, he was elected president for the twenty-sixth time. During the first quarter-century a total of 14 members were elected to the board of directors. One of these declined to serve. The tenure of the remaining 13 has ranged from 1 to 25 years and averaged nine years.

The tenures of the three officers elected by the board of directors have been: president, one for twenty-five years; secretary, one for almost five years, one for almost six years, and one for fifteen years; treasurer, one for fourteen years; and one--formerly secretary for almost six years--for eleven years.

There appears to have been sufficient continuity in management to insure stability and sufficient change to avert stagnation.

Maintenance and Repairs.--Not long after the Company began to provide service, expenditures for maintenance and repairs began. In the annual financial statement made to the stockholders on October 10, 1922, there is an item, "Labor on line, \$236.05". This sum was not quite \$8.00 per mile of line. Usually the labor is performed by persons employed by the hour or day. Throughout most of the quarter-century, the Company has been fortunate in having the services of an individual who seem ideally qualified for the duties of line-maintenance and

repairman. He is employed by the hour. When he is not working for the Company he operates an electrical and mechanical service available to members of the Company and to the general public. Known appreciatively as Handy Andy, Mr. Andy Strahm is a competent maintenance and repair man for the Company and a much-employed electrical "trouble-shooter" for the community. The good condition of the Company's distribution system and the reliability of the electrical service are due in large measure to his skill and devotion.

Good Will in Management and Operation.—A visitor to the community served by the Company is likely to be impressed by the evident prevalence of good will. The atmosphere of friendliness doubtless helps to explain the success of the numerous cooperative enterprises already mentioned. Good will seems clearly to be an important factor in the management and operation of the Company. One evidence of this is a Christmas greeting sent by the board of directors to all the members in December, 1941. "For over 20 years", the greeting card read, "your splendid cooperation has made possible the service you now enjoy. The directors of your Company appreciate your help and take pleasure in wishing you and yours a Merry Christmas and presenting you your bill for the last quarter of 1941 marked paid".

LEGAL FEATURES

Within wide limits the Company is autonomous, a law unto itself. It is not required to go to the State Corporation Commission for authority to increase its rates or charges. It operates with a minimum of regulation other than self regulation.

Basis of Autonomy.—Its autonomy rests chiefly on two facts: it obtains its current from a municipally-owned generating plant, and it is a non-profit corporation, organized under the laws of Kansas.

Kansas statutes and court decisions underlie the Company's high degree of freedom from outside restraint. Section 66-104 of the Statutes of 1935 specifically excludes municipally-owned-and-operated utilities from the jurisdiction of the State Corporation Commission. The legal authority for such utilities to extend their lines into the adjacent countryside is upheld by the State Supreme Court in Board of Public Utilities of Kansas City *versus* Kansas City Power and Light Company (139 K 842). The Company's freedom to change its rates and other charges at will appears to be based on the theory that if the members of the Company wish to overcharge themselves they should be free to do so.

The By-Laws.—The Company's by-laws provide the major regulations governing the actions of the organization and its officers. The by-laws require that the stockholders meet annually and that there shall be five directors, one elected each year by

the stockholders. They designate the number of stockholders and of directors necessary for a quorum, define the duties of directors and officers, and require that each stockholder purchase one share of stock for each of his farms using the service. They provide that the share of stock shall attach to the farm and must be transferred to the buyer if the farm is sold. These and other similar provisions compose the by-laws, which may be amended at any annual meeting by a two-thirds vote of the stockholders present.

Absence of Litigation.--It seems noteworthy that a pioneer enterprise involving numerous situations and problems which might easily lead to legal conflict could have continued for 25 years, as the Company has, without once engaging in litigation. The nearest approach to litigation was the filing of a complaint with the State Corporation Commission by a telephone company whose line was crossed by one of the Company's transmission lines. The subject was discussed informally by representatives of the interests concerned, the complaint was withdrawn and the matter was settled amicably. It has been the practice of the Company's officers to discuss problems, personally and in a friendly spirit, with those concerned. This practice, together with the Company's desire to deal fairly, seems to account for the long-continued absence of litigation.

MAJOR FINDINGS

Some of the findings in the case study here reported upon are stated below. It may be that some of these findings can be applied effectively in other rural communities in which the people wish to improve their conditions by their own efforts, particularly by means of rural electrification,

1-The most important facts involved in the study are first, that a small group of farmers, by working together intelligently and without financial aid from outside the group, have provided for themselves a valuable service that could not be obtained by the individual members working alone; and second, that the service has continued with increasing satisfaction for a full quarter-century.

2-In view of the almost complete absence of rural electrification from the state when the subject of this report was instituted, the group here referred to may be properly regarded as among the pioneers in rural electrification in Kansas.

3-A sound type of agriculture operated by sturdy and intelligent people and the prevalence of a strong cooperative spirit in the community contribute significantly to the success of the rural institution studied.

4-As a non-profit cooperative obtaining its electrical current from a municipally-owned generating plant, the Company enjoys virtually complete legal autonomy.

5-By substantial construction and adequate maintenance the Company has maintained an efficient distribution system, which doubtless has contributed to the Company's satisfactory experience of loss and damage and made possible a low cost of liability insurance.

6-Extensive service given without pecuniary compensation by the Company's officers and directors has kept overhead costs much lower than they would be if the service were paid for in the usual way.

7-Long-continued employment of a competent maintenance and repair man has been an important factor in the Company's success.

8-Repeated re-election of some of the most competent and devoted officers and directors has provided continuity of policy, and the election of new directors from time to time has been a safeguard against stagnation.

9--Through the use of adequate construction and maintenance of physical facilities and through the exercise of good will in its relations with its members and with the public, the Company has avoided litigation throughout a quarter-century.

10-Simplicity and directness characterize the procedures of the Company and are an important factor for its success.

11-The Company's policy of maintaining an adequate financial reserve is not so common as it should be among rural cooperatives, and is to be commended as is its policy of carrying liability insurance.

12-By the use of penalties for delinquency in the payment of bills for electricity and rewards for prompt payment, the Company has had a reasonably satisfactory delinquency record.

13-The number of electrical appliances in use and the quantity of electricity used, both per farm and per mile of transmission line, have increased markedly during the quarter-century.

14-As use has increased, rates per unit of energy have been reduced. The rates paid by the Company for energy purchased and those charged by it for energy used by consumers have fallen about 50 per cent in the past 20 years. Further marked increases in use would make possible still lower rates and still lower average costs per KWH.

15-In the Company's early years, the home-improvement aspects of rural electrification received major emphasis; house lights usually were the first electrical appliance installed, as they are now the only appliance used on all farms served by the Company. But as time has passed, the possibilities of rural electrification in increasing financial income have received increasing attention, so that at present appliances used chiefly or entirely for financial reasons are approximately equal in number to those used chiefly or entirely for their value in home improvement on the farms served by the Company.

SUGGESTIONS FOR IMPROVEMENT

As the Company's methods have given general satisfaction to those most concerned, the following suggestions for improvement are for possible use by new organizations primarily and for consideration by the Company only incidentally, if at all.

1-Less lenient penalties for delinquency in the payment of bills seem desirable. When delinquency does not begin until 15 days after the rendering of the quarterly bill, to postpone disconnecting the delinquent for an additional six months plus 30 days for notice of disconnection seems excessive. A comprehensive statement of current delinquency might well be included in each annual report to the stockholders.

2-Less generous rewards for prompt payment of bills probably would be sufficiently effective. The present 10 per cent discount for payment within 10 days is far above most comparable commercial discounts. The present discount rate seems unnecessary rather than objectionable, unless it be regarded as an offset to the unusually lenient penalties for delinquency.

3-The Company's annual financial report could be made considerably more useful, with little or no increase in cost, through the use of a little more consistency. For example, some annual reports show receipts from the sale of energy and from the sale of supplies as a single item, while others show the two as separate items, as is preferable. Persistent use, year after year, of the same form of annual report and of substantially the same items, each covering one definite subject, would facilitate the important process of keeping both the directors and the members adequately informed regarding the Company's detailed financial experience.

4-Any rural electrification cooperative might well include in the program of its annual meeting discussions and demonstrations of topics directly affecting rural electrification. Such topics as safety devices and practices, new electrical appliances, keeping appliances in order, and new uses for familiar appliances could be used. Such a program might increase the attendance and stimulate the interest at the annual meeting, and so help to increase the strength and the usefulness of the organization.

5-Finally, it is important to emphasize the possibilities of reducing costs per unit of electric energy through increased use. The Company has made significant progress in this direction, but the possibilities for additional progress have not been exhausted.

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pany who provided information on their uses of electricity; the members of the present board of directors-President E. T. Ukele, Secretary Lewis Bahr, Treasurer John McNary, Arnold Streit, and Robert Montgomery-who gave the study their blessing and aided generously in its conduct; Andy Strahm, the maintenance and repair man, who helped in various important ways; and Mrs. Anna Montgomery, Mrs. Lewis Bahr, and Mrs. E. T. Ukele, who hospitably opened their homes for use in the examination of the Company's records and in other features of the study. The generosity, friendliness, and helpfulness of all these made the conduct of the study a pleasant and interesting experience.