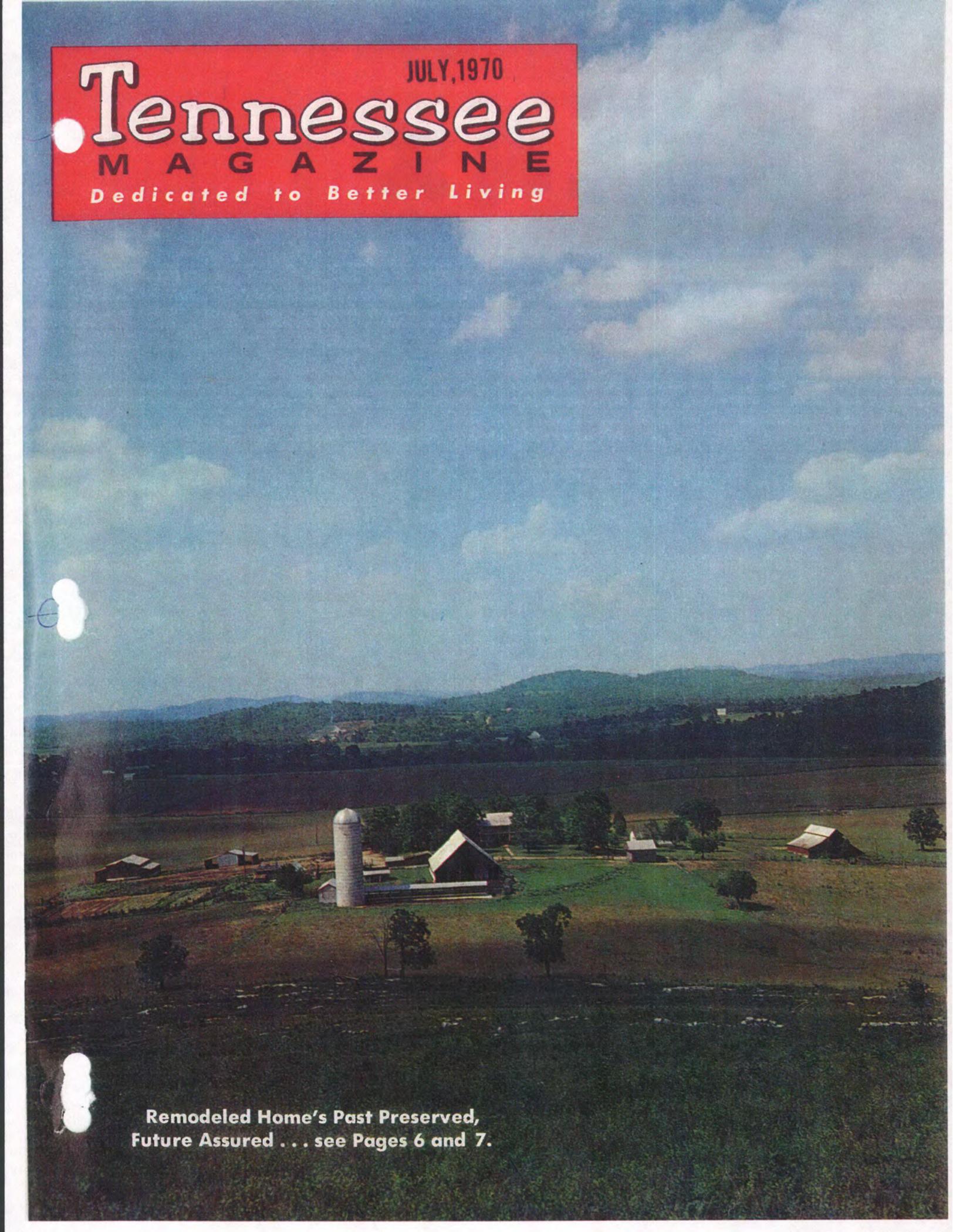


JULY, 1970

Tennessee

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An aerial photograph of a rural farmstead in Tennessee. The scene features a prominent white cylindrical silo, several wooden barns with gabled roofs, and a large open field. In the background, rolling green hills are visible under a blue sky with scattered white clouds. The overall atmosphere is peaceful and scenic.

**Remodeled Home's Past Preserved,
Future Assured . . . see Pages 6 and 7.**

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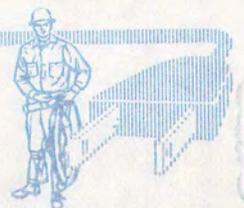


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Official Publication of the
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Executive, editorial and
advertising offices:

710 Spence Lane, P.O. Box 7232
Nashville, Tenn. 37210

J. C. Hundley, Executive Manager

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STAFF

John E. Stanford Editor
Don Murray Adv. Mgr.

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POSTMASTER: In using Form 3579 please give our key number and mail to The Tennessee Magazine, Box 7232, Nashville, Tenn. 37210.

THE TENNESSEE MAGAZINE is published monthly as an educational and informational service to members of rural electric cooperatives in Tennessee and in behalf of the welfare of their program. Second class postage paid at Memphis, Tennessee. Published monthly, at 3781 Lamar Avenue, Memphis, Tennessee 38118. Subscription price: 87¢ per year for members and \$1.00 per year for non-members.

Printed and mailed by Shea/Rustin, Inc., Atlanta



ON THE COVER

With the availability of electricity older homes can be modernized without loss of their original charm. Our cover pictures the remodeled and added-to home of Mr. and Mrs. Ray Barker. Its story is on Page 6 and 7 of this issue.

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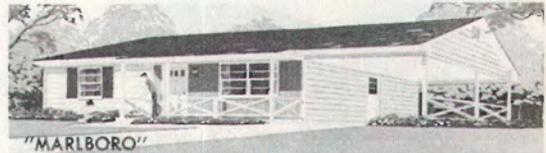
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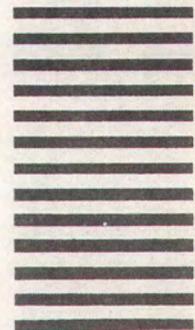
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Volunteer Views

by **J. C. Hundley**
Executive Manager, TECA

One needs not be a super-patriot to feel a sharp tingle of pride as each July 4th, in its full and true meaning, enters our thoughts, our consciences, our souls. To be sure, there are a relatively few Americans to whom July 4th means little more than a holiday (if they are employed) or an event reserved only for foolish sentimentality. But we believe that the overwhelming majority of Americans do love their country and cherish its history and traditions. If this had not been true for almost two hundred years, it's unlikely there would even be a nation such as we know and love it.

Next to the Bible, there is nothing in print or existence more hallowed to most Americans than the Declaration of Independence, the Bill of Rights and the Constitution. Without the Declaration of Independence, adopted 194 years ago on the 4th day of this month, there probably would have been little or no need for the other two.

So treasured is the Declaration of Independence that the bronze and glass case in which it rests in Washington, D.C. is filled with helium gas, protecting it from possible damage from free oxygen. Special filters have been blended into the glass, shielding it from the ultraviolet rays of sunshine. A steel and concrete vault beneath the floor protects it from fire, bombing or invasion, with a special mechanism that can quickly lower it into this fireproof-bombproof chamber, should danger threaten. An armed guard is present 24 hours every day. No person is denied the right to see and read this document. No amount of money could buy it. It is no more for sale than are the principles of liberty and justice upon which our nation was founded.

One day prior to the 4th of July in 1947, at which time the world was relatively at peace following World War Two, Dr. Peter Marshall, the subject of the book, "A Man Called Peter" and perhaps the most noted of all U.S. Senate chaplains, gave the following prayer which is as appropriate now, and in time to come, as it was when offered 23 years ago:

God of our fathers, whose Almighty hand hath made and preserved our Nation, grant that our people may understand what it is they celebrate tomorrow.

May they remember how bitterly our freedom was won, the down payment that was made for it, the installments that have been made since this Republic was born, and the price that must yet be paid for our liberty.

May freedom be seen not as the right to do as we please but as the opportunity to please to do what is right.

May it ever be understood that our liberty is under God and can be found nowhere else.

May our faith be something that is not merely stamped upon our coins, but expressed in our lives.

Let us, as a nation, not be afraid of standing alone for the rights of men, since we were born that way, as the only nation on earth that came into being "for the glory of God and the advancement of the Christian faith."

We know that we shall be true to the Pilgrim dream when we are true to the God they worshiped.

To the extent that America honors Thee, wilt Thou bless America, and keep her true as Thou hast kept her free, and make her good as Thou has made her rich. Amen.

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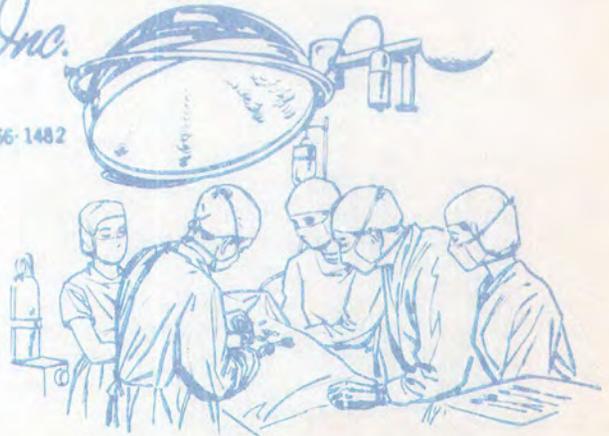
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Past Preserved, Future Assured In Remodeled, All-Electric Home

By Harris Florida, Electrification Advisor
Middle Tennessee E.M.C.



This picture is a view of the right side and rear of the house just after remodeling started.



This is the same view as shown above and made upon completion of the remodeling.

Ray Barker had a problem. It was an old house, over 120 years old; and a love for the old house wouldn't let him leave it or replace it. It was very inadequate for his present family and not suitable for modern all-electric living. The only alternative was a major remodeling job.

Mr. and Mrs. Barker thought and planned and dreamed. Ideas came. Some were kept. Some were discarded. One thing they decided was that they could use some help, and one of the people they called on was the writer as electrification advisor for Middle Tennessee Electric in Murfreesboro.

The Barker home, located on a beef cattle farm at Readyville, in Cannon County, is served by Middle Tennessee Electric.

The Barkers are the third family to own this house. It was previously owned by the Woods and Dickens families. Ray's father and two brothers purchased the 578 acre farm in 1915. His mother later bought the place and Ray, by buying adjoining land, has increased the size to 1,040 acres.

The house was built in 1846 by John H. Woods. The limestone slabs for the two 45' chimneys, fireplace, steps, and basement were cut by slaves. The basement, which has 1270 sq. ft. of space, has a floor made of 4' x 6' rock. The floor is as level as if it were concrete. Word has been handed down that it took four years to complete. There are two chimneys, one of which has three fireplaces, one in the basement, one on the ground floor, and one upstairs.

Each of the six main sills of the house are one solid piece of oak, 51 ft. long and 12" square. Every wall has cross braces that are 4" x 12". All of the original house was put together by wooden pegs.

The original house had three rooms and a hall downstairs and two rooms and a hall upstairs



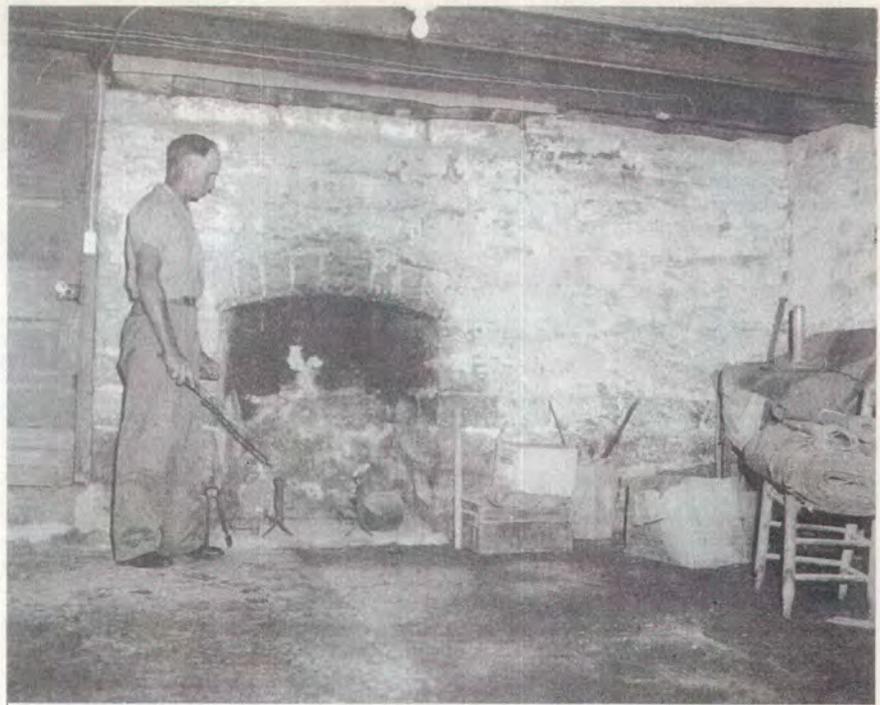
Mrs. Barker is shown in her new "all electric" kitchen. The large kitchen contains the cooking and preparation area as shown, a large cabinet storage area, a planning desk, and a large eating area. The breakfast table is located in the corner next to two sets of large, double windows which offer a beautiful view of the valley below.

with a porch and a large wooden water tank to the rear. The four front rooms, two upstairs and two downstairs, are all 20 ft. sq. All of the original house has wainscoting with beaded window and door facings and wide paneled doors. The original ceilings were 9½ ft. high so all the new rooms were made consistent to the old. The original house did not have a kitchen. Slave cooks prepared meals at the fireplace in the basement. (See picture.)

In remodeling the old house the Barkers wanted to keep as much of the charm of the colonial as possible, at the same time adding the convenience of the modern. The five original rooms and two halls were to be remodeled and the original basement kept as it was. They wanted to add one bedroom, dining room, utility and sewing room, kitchen, four baths — one in the basement, two on the ground floor, and one upstairs — and a full two car garage under the new addition. The old dining room was to be converted to a den with full wall closets on one side and full wall book cases, desk, and gun cabinets on another.

Mr. and Mrs. Barker requested a lighting and wiring layout for the entire house to meet "Gold Medallion" standards for wiring. They wanted plenty of light inside and out, light switches to control lights at each door in each room, fully equipped electric kitchen, and electric baseboard heat. The house was first wired for electricity in 1928 and it was decided to rework the old fixtures and use them in the old part of the house.

Middle Tennessee Electric made



Mr. Barker is shown at the fireplace in the basement. This is one of three fireplaces in the one chimney. When the house was first built, this fireplace was used as the cooking area by the slave cooks. The floor in the basement is made of 4'x6' rock slabs laid by slave laborers. The entire basement is rock, as shown. The Barkers use the basement to store fruits and vegetables and to refinish old furniture.

a complete wiring and lighting layout for the house, recommending a 400 amp. underground service which was later installed.

The remodeling was started by tearing off the old porch and framing in the new 3000 sq. ft. main floor addition. Due to the lay of the land this addition was so high off the ground it made a 1700 sq. ft. garage and work space fit perfectly under the addition. Once the new addition was framed, Joe Rogers, contractor

from Woodbury, started disassembly of the interior of the existing structure. This was essential in order to insulate and to run the many electric wires needed for lighting, switching, heating, and convenience outlets. The old doors, trim, etc., would be replaced as it was originally.

Since the boys' bedrooms were upstairs, there was a need for an upstairs bath. This was finally located just off the spiral stairs

(Continued on Page 20)



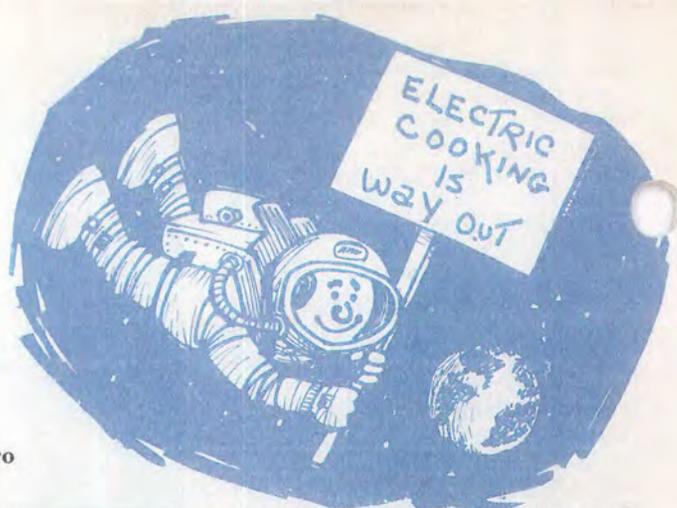
This picture shows the Barker family in front of the house after completion of the remodeling. Shown R to L: Ray Barker, Mrs. Barker, and sons Mark, Boyd, and John.



This picture shows a front view of the old house prior to remodeling. Notice the old upper porch which was removed in the remodeling.

Cook Like The Astronauts

By Mrs. Patsy Myers, Home Economist
Middle Tennessee Electric Membership Corporation, Murfreesboro



This picture was made during a demonstration I was giving to a home economics class of juniors and seniors at Smyrna High School. On my right are Rachel Friedman and Martha Crosslin looking at the instruction book for the Amana Radarange I am using. The teacher of the class is Miss Patricia Allen (upper right).

When the astronauts, who landed on the moon, returned to earth and had to be in isolation for several days, five portable microwave ovens shipped from a dealer in Tennessee were there in the isolation chamber to cook their food.

Truly, microwave ovens are well-suited to cooking in the space age. Said to be the greatest cooking innovation since the discovery of fire 10,000 years ago, they are becoming increasingly popular with today's busy homemakers because of the speed with which they cook.

Government officials estimate that by the middle 70's, microwave oven sales will account for one out of every four ovens sold—about 2 million units.

Conventional electric oven units produce heat which begins outside the food and penetrates gradually until the food is cooked through. The microwave or electronic oven employs very high-frequency radio waves to penetrate the food instantly from all angles so that heat is evenly and rapidly distributed through the food, resulting in almost instant cooking.

By using an appliance which will have a five-pound beef roast ready for the table in thirty minutes, or bake a medium-sized potato in four minutes, homemakers can serve their families regular meat-and-potatoes dinners even after working eight hours at the office.

Unpleasant oven-cleaning chores are eliminated with the

microwave oven. This type of cooking is essentially clean. Because dishes and oven walls never get hot, spatters don't burn on. Usually a quick wipe with a damp sponge will do the trick. Or, allow a cup of water to boil for a minute or two in the oven, then wipe the moisture away with a clean, dry cloth or paper towel.

The rapid cooking seals in juices, natural minerals, and vitamins which are sometimes lost in conventional cooking processes. The sealing process also enables food to be reheated several times while still maintaining its original flavor and texture. For example, corn on the cob, never very tasty when reheated after conventional cooking, will taste freshly cooked when reheated electronically after electronic cooking.

Because the heat-producing microwaves penetrate the food evenly and quickly, cooking utensils usually remain cool and pot-holders are seldom necessary. Food may be cooked in the same container in which it goes on the table, then stored and reheated in the same container.

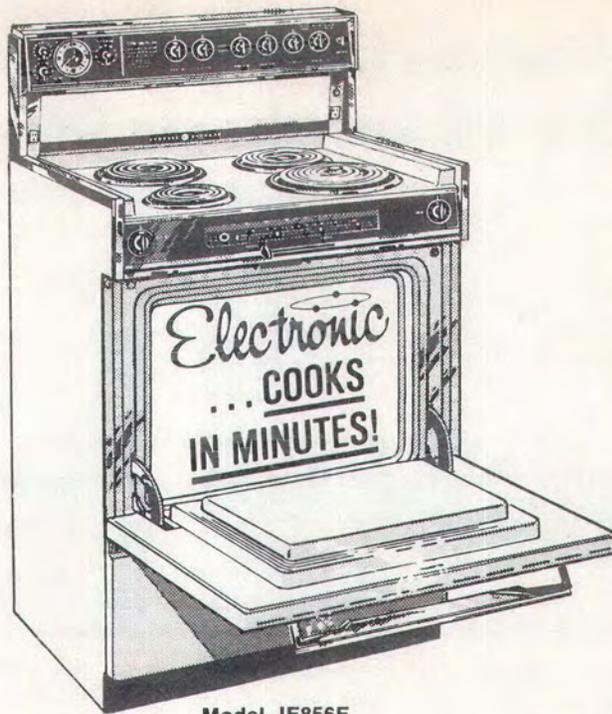
For foods which require shorter cooking or heating time, paper plates and hot drink cups may be used. Oven-proof glass and ceramic ware are used for longer periods of cooking.

Metal containers are never used in microwave ovens, since metal reflects the waves away from the food, causing uneven cooking and sometimes damage to the magnetron tube.

Since microwave ovens are so easy to operate, all members of the family will love to cook. You do not have to be concerned with temperatures—just time. Be sure to follow instructions from the instruction book that comes with the microwave oven. This is the



Mrs. Walter Brown, West Main Street, Lebanon (above), has had her electronic oven for about 7 years. She and her husband own a hatchery and both of them work. She says they can come home from work and have their evening meal ready in a few minutes by using their electronic oven, which they would not be without for any price.



Model JE856E

Here we see the picture of one of the ovens which combines electric and electronic cooking all in one appliance, which the manufacturer calls versatronic. It cooks conventionally with bake and broil units, cooks electronically, cooks in combination of conventional and electronic, and cleans itself electrically.

only way to get the most pleasure from using it.

With the portable electronic or microwave oven, many, many foods may be cooked better and faster, but with some foods, this has to be supplemented with conventional cookery. Therefore, several manufacturers are putting both processes together in one oven.

If you plan to add electronic

or microwave cooking in your home or business, be sure to shop around for the oven which will suit your needs best. When you buy, read your instructions carefully and follow them so as to take advantage of every phase of cooking it may be used for. The list of foods which cannot be cooked successfully electronically is becoming shorter every day. In the near future, you will be seeing

convenience foods in your grocery store particularly adapted to electronic cooking.

Cook as the astronauts do — with space age electronic ovens, and enjoy the easy, quick way of preparing nutritious foods, either in individual portions to suit each individual taste of the family, or in family-size portions cooked in the kitchen, on the patio, or wherever you like.



This range is so easy to cook with that a man who never cooked before gives demonstrations with it. Here we see Mr. Harry Johnston, of the Shelby-Skipwith Company, giving a demonstration to a group of Electrification Advisors and Home Economists in a recent workshop held at Jackson, Tennessee.

Electric, no-frost refrigerator/freezers have ended defrosting forever, and many models make ice cubes automatically. New slim-line insulation means more room inside, without enlarging outside dimensions.

Light up your Life



Electrically

Rural Housing In Tennessee Gets Big Assist From The Farmers Home Administration and...



Pictured above is an old, inadequate home which has been completely replaced by the new, adequate modern home by means of a Farmers Home Administration loan. This actual replacement has been duplicated hundreds of times in Tennessee thanks to FmHA, an agency of the U.S. Department of Agriculture.

The Farmers Home Administration advanced approximately 33 million dollars to 3200 rural families of Tennessee to purchase, build or repair their homes during the first eleven months of this fiscal year. Paul Koger, FmHA state director, has expressed pleasure as to the size and adequacy as well as the cost of the dwellings included in these figures.

During the fiscal year ending June 30, 1969, 1114 loans were made to construct dwellings at an average cost of approximately \$10,150. At the same time 252 new dwellings were purchased on nonfarm tracts at an average cost of \$11,000; also, 425 used dwellings on nonfarm tracts were purchased at an average cost of \$7,600. The dwellings constructed with a Farmers Home Administration loan, as well as the new ones purchased, were predominately brick veneer with living space averaging approximately 1100 square feet. Preliminary data indicates that loans made since July 1, 1969 to construct and purchase new dwellings averaged approximately \$11,000, with size holding to approximately 1100 square feet of living area.

Mr. Koger states that the Farmers Home Administration has long recognized the inadequacy of housing in rural areas of this country. He expressed appreciation for the general recognition

of the need for improved housing as being one of the major problems of this country. The added attention being given to this problem by the Farmers Home Administration is emphasized by the approximate 100 percent increase in loans in Tennessee for the first eleven months of fiscal year 1970 as compared to the first eleven months of last fiscal year. The President's budget for fiscal year 1971, if approved as submitted, will enable the Farmers Home Administration in Tennessee to make a 75-80 percent increase in its rural housing loan program.

The Farmers Home Administration, an agency of USDA, is authorized to make housing loans in rural areas. Rural areas are defined as not only open country but also populated places and small towns of 5,500 or less.

State Director Koger emphasized the objective of the Farmers Home Administration in the field of housing is to provide eligible low-to-moderate income families with modest housing that will meet their basic needs. He further stated that over the years the Farmers Home Administration had found that eligible families can be modestly but adequately housed in three to four bedroom dwellings containing 900 to 1200 square feet of living space.

Mr. Koger stated that we cannot over-emphasize the important

role local community leaders must take in recognizing, publicizing and activating needed housing improvement programs in their respective communities and towns. He stated that someone must take the initiative to develop building sites, roads and streets. Someone must also take responsibility for water, waste disposal and other utility systems as well as community parks and play grounds.

This leadership must include, among others, representatives of financial institutions, housing builders and contractors, building supply dealers as well as county and city officials who relate new housing starts to the economic growth of their communities.

The Farmers Home Administration fills the credit gap for families in need of housing who are unable to meet the terms and conditions of conventional sources of credit. Mr. Koger states that since the beginning of the Rural Housing Loan Program in 1949, approximately 16,000 rural families in Tennessee have received housing loans. As of March 31, 1970, 13,700 of these loans were active with an unpaid balance of \$118,530,000. Of the unpaid loans, less than five percent were delinquent on March 31, 1970. As of that date, loan losses amounted to less than 1/100th of one percent of the total amount loaned.

...Agency's Rural Aid Would Increase With Legislation to Bolster Water, Sewer Facilities

Earlier this year Rep. John C. Watts (D-Ky.) introduced a bill, H.R. 16813, which would again enable Farmers Home Administration (FmHA) to make insured loans to small towns for water and sewer systems.

The Watts bill is one of several that seek similar goals. The others are H.R. 15979 by Rep. John Byrnes (R-Wis.); S. 414 by Sen. Joseph M. Montoya (D-N.M.); and S. 3559 by Sen. James B. Pearson (R-Kan.).

The proposals they contain would be of inestimable value in developing the countryside. It would be to the distinct advantage of every rural American to support this legislation in any way he can. The following story tells why.

One of the most critical needs of small towns and rural areas is for adequate water and waste disposal facilities. This need was recognized in 1965 when the Congress passed legislation authorizing the Farmers Home Administration to make loans and grants for water and sewer systems to communities of under 5,500.

However, since 1967 the Treasury Department has prohibited Farmers Home from making insured loans for water and sewer systems to small towns and rural public bodies. These constitute 70 per cent of the applications for such assistance. There are nearly 35,000 towns of less than 5,500 population lacking adequate water supply systems, and approximately 44,000 without adequate waste disposal facilities.

In effect, the Treasury prohibition against insured loans makes it impossible to extend more than token assistance to rural communities. At present only direct loans are available to rural public bodies for water and sewer projects. The amount of direct loans is miniscule compared to the needs. For instance, the budget request for FmHA direct loan funds in fiscal 1971 is \$40-million. Apportioned among 50 states, at best this would provide perhaps five or six loans per state.

At present FmHA is inadequate to meet requests for water and

sewer loans. Since 1966 Farmers Home has received over 12,000 applications for water and sewer loans totaling nearly \$2-billion. Of these it has had to reject approximately 6,000 totaling nearly \$1-billion. It has only been able to fund about \$700-million of the requests.

Because of the tight budget situation, it is unlikely that direct appropriations will be forthcoming in sufficient quantity to solve this very serious problem. The Watts bill (or the other similar bills) would again enable FmHA to provide insured loans for water and waste disposal purposes.

Unlike direct loans, insured loans have little impact on the budget because the funds come from private investors. FmHA purchases tax-exempt bonds of rural communities as security for loans through its agricultural credit insurance revolving fund and then resells them on the private market. The proceeds reimburse the fund and are available for reloaning.

Since FmHA guarantees the payment of the interest and principal on the tax-exempt bonds to the purchasers, the Treasury position is that this gives an unjustified tax advantage to the investors.

While it would appear that the Treasury objection is a valid one, the result has virtually cut off hope of small towns obtaining the assistance they must have if they are to survive. It is unrealistic to expect that rural people will stop migrating to the big cities — or that urban residents will settle in rural areas — if such basic necessities of modern-day living, such as water and sewer facilities, are unavailable.

The recently introduced legislation would permit Farmers Home Administration to purchase the tax-exempt bonds of rural public bodies at a maximum interest rate of 5 percent. The agency would then resell them at a higher rate to private investors.

However, the purchasers would agree to pay income tax on the interest they received from FmHA. This would in no way affect the tax-exempt status of the bonds, or the authority of municipalities

or other public bodies to issue tax-exempt bonds.

In the fiscal 1970 budget, an additional \$245-million in water and sewer loans is authorized pending adoption of this type of legislation. If this legislation were to be passed promptly, FmHA would have every reason to expect approval from the Bureau of the Budget to substantially increase in this fiscal year the funds for such loans.

Many prominent voices espoused the logic of developing rural areas as an alternate to the continued overcrowding of our cities and the grave problems that such population imbalance causes. Everyone agrees that the depletion of rural America only compounds the serious plight of our large metropolitan centers.

H. R. 16813 and other bills like it offer legislation essential to developing the kinds of rural communities which people will wish to remain in and to which new residents will be attracted. Moreover, the legislation is closely related to another matter of urgent national importance: pollution control. Lack of adequate waste disposal facilities in rural communities increases pollution of our nation's water resources.

It is expected that FmHA would have to offer 8 percent interest to sell the bonds while receiving 5 percent from the borrowers. Despite this 3 percent subsidy, there should be no cost to the Federal Government. Most of the purchasers are in the 50 percent tax bracket. The taxes they would pay on the 8 percent interest would offset the interest subsidy.

For example, FmHA would collect on \$100-million in loans, 5 percent interest a year or \$5-million. It would pay to the purchasers 8 percent or \$8-million. In turn the purchasers — who, as noted, are generally in the 50 percent bracket — would pay \$4-million in taxes on the interest FmHA paid them, or \$1-million more than the subsidy incurred by FmHA. Even if Farmers Home had to offer a 9 percent interest rate, it would still break even. And indications today point to a decline in interest rates.

(Continued on Page 20)

What you should know about this summer's power crisis

This summer, our nation will face its most critical power shortage since World War II.

Average reserves available nationwide to meet hot weather's demand peaks will be four per cent below the "desirable" level. Any unexpected development, such as a prolonged heat wave, could be catastrophic.

Why is our country in this bind?

The chairman of the Federal Power Commission, John N. Nassikas, has pointed out that one of the most important reasons is that "...increase in demand has outstripped the original forecast upon which utilities planned their system." Other national power experts agree. Until recently, predictions were that power needs would double about every ten years. Now, indications are that this demand may double every 6½ to 7½ years. That means reserves are getting lower and lower.

Industry efforts to catch up are complicated by other factors. Fuel supplies, particularly coal, are short; skilled labor is scarce; equipment delivery dates are delayed; component fabrication is too often faulty; transmission facilities are not adequate. Add to this questions of how to increase power supply without increasing environmental pollution.

While it's useful to know how the present situation came about, our immediate problem is moving ahead with corrective measures.

Consumer-owned rural electric systems...serving less than a tenth of the nation's total population scattered over seven tenths of the country...came into being during the great power crisis of the 1930's—when most of rural America had no electric light and power.

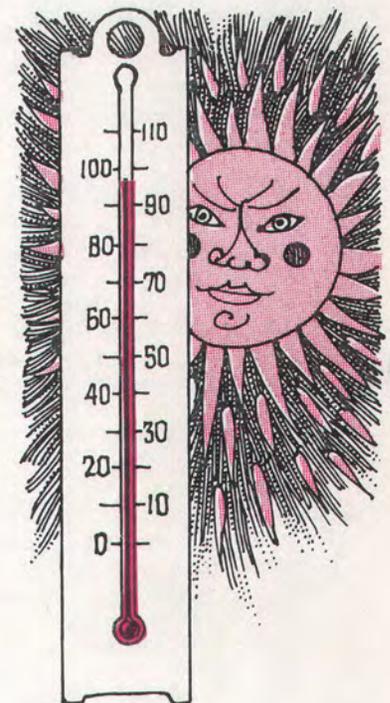
Today, all America faces a power crisis. While large urban centers are facing the worst shortages, the implications of this crisis are national in scope. We of the nation's rural electric systems—systems largely dependent on commercial suppliers for power—are actively seeking to bring about solutions we believe to be workable.

To meet the shortage of power in particular areas, we have long pressed—and will continue to press—for better regional and national planning...regional and national pooling of power resources—a nationwide grid to take advantage of different load-peaking times in different parts of the country. Such a grid would speed one area's surplus to fill another's deficiency.

To meet the shortage of power capacity we have long pressed—and will continue to press—for expanded and additional generation and transmission facilities. Rural electric systems own only 1½ per cent of the nation's total capability. This must be beefed up to help the electric industry as a whole meet our country's needs for power...in keeping with the need for healthy, livable environment.

To bridge the gulf of misunderstanding between the concerned public on one hand and the concerned electric industry on the other, we have urged—and will continue to urge—that environmentalists and conservationists be included in a blue-ribbon planning group of state and Federal regulators, along with representatives of all segments of the power industry. Our national government...our country...needs the guidance that such a group could provide.

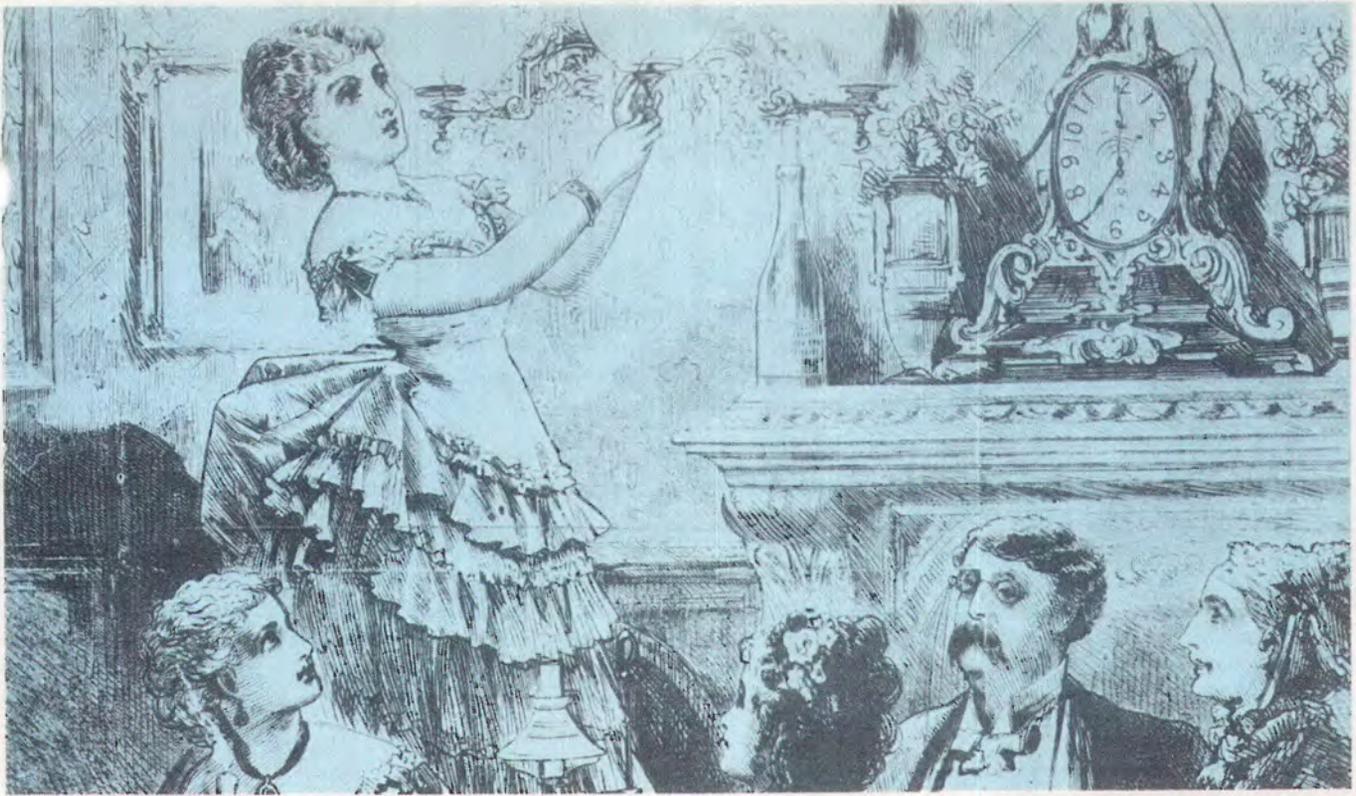
We are in a very tight power situation, which could get much worse. We of the country's rural electric systems are determined to do everything we can to avert this crisis. Mobilizing our national will to solve the problems is the first order of business.



AMERICA'S RURAL ELECTRIC SYSTEMS

Owned and controlled by the people they serve

For more information write National Rural Electric Cooperative Association / 2000 Florida Avenue, N.W., Washington, D.C. 20009



THE HISTORY OF LIGHTING

Stone lamps 20,000 years old were recently discovered in the Lascaux caves of France — offering evidence that our ancestors didn't live in the dark ages after all.

The Sumerians, 2,500 years before the birth of Christ, used lamps of gold and alabaster. The Romans were also extravagant when it came to lamps; Pliny records that one richly decorated lighting device set its owner back 50,000 sesterces (roughly \$3,000) — and it probably didn't even have a shade!

Remarkably enough, the Romans are said to have preserved lamps in some of their sepulchres for centuries, and many legends are told of their never burning out. In the papacy of Paul III (1534-40), a lamp was found in Cicero's daughter's tomb, which had been shut up 1,550 years before, and was supposedly still burning.

One of the most famous sources of light to shine from the ancient world, was built by the Romans at Boulougne, on the coast of France. It was a lighthouse 200 feet high and 192 feet in circumference — using great bonfires for signals — and it stood as a reliable guide for mariners for more than 14 centuries!

Gas lamps, on the other hand — the most "modern" source of light before Edison — were used by the ancient Chinese who brought gas up

from 1,600 feet below the surface of the earth, then piped it around town in bamboo rods.

Some of the lighting devices of today are just as remarkable. For example, there is a lamp that prevents wool shrinkage and another that can make flowers grow at night. Even more recently, industry has come out with unbreakable flexible light — in panel or tape form!

Known as an EL lamp, the device emits soft glowing light and offers a life of about five years. It consists of separate layers of aluminum foil, phosphors, translucent conductor material and copper leads — all sealed within special plastic film which acts as a moisture-proof sandwich — which protects the light from cracking, chipping, peeling and corrosive atmosphere.

In tape form the light may be a mile or so long. For practical applications, one firm uses the material to make flashing belts and signs for highwayworkers and emergency crews.

More recently, EL lamps are being used as instrument panels for the Lunar Exploratory Module and Command Modules of Apollo spacecraft. Who knows? EL lamps may one day light our way to the moon!

But EL lamps and their bright electrical cousins that we use every day, were a long way in coming. For it was way back in 1801 that Sir Humphrey Davy invented the carbon-arch lamp — and ushered in the beginning of electrical lighting. But the lamp proved to be merely an unusual novelty

and oil lamps continued in vogue during the 19th century.

Between 1878 and 1880, Thomas A. Edison and Joseph W. Swan finally developed a practical electric lamp for interior lighting. After many attempts, they discovered a filament that glowed satisfactorily in a vacuum and which didn't use up too much current; this filament was a thread of carbon — that glowed brightly with a yellowish light.

Today, the United States leads the world in making electric light bulbs — turning out about 2-1/4 billion lamps every year. More than 700 million of these are for general lighting (15 to 150 watts). About 500 million are for miniature lamps, and some 120 million are Christmas tree lights.

Engineers in the meantime, have developed many types of bulbs. Two of the most efficient of these are sodium-vapor and mercury-vapor lamps — which are used to light highways, factories, television studios and canals. Lamps filled with rare gases such as neon and krypton are widely used for airport fog lights and advertising signs.

Fluorescent lamps furnish so-called "cold light." Using the same amount of power, they are able to produce several times more light and only one-fourth as much heat as filament lamps do.

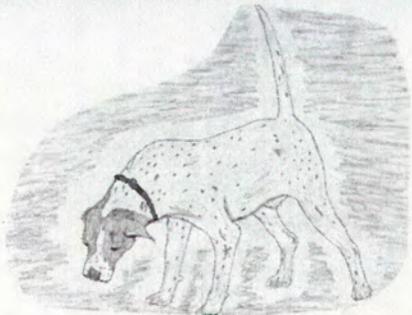
We've come a long way from the first stone lamps which our ancestors used some 20,000 years ago — and it's been a very bright and enlightening journey to be sure.

Uncle John's Page

This page is reserved for the young folks. We will pay one dollar for each poem or drawing published. ALL WORK MUST BE ORIGINAL. Drawings should be in black, and drawn on white, unlined paper. Tell us your age, address, and Electric Co-op, and

Send all items to:

UNCLE JOHN, The Tennessee Magazine
710 Spence Lane, Nashville 10, Tenn.



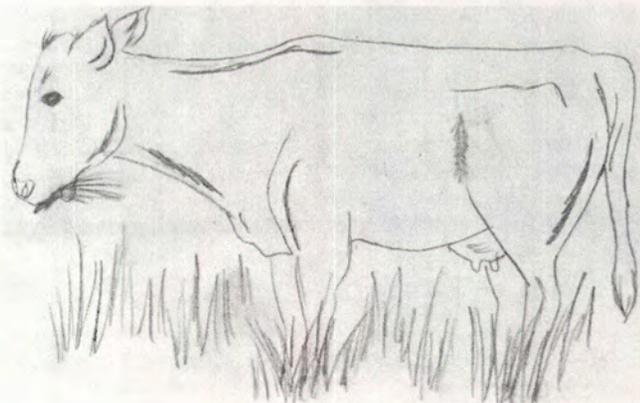
Kelly Cuthbertson, Age 11
Box 11, Crossnore, North Carolina
Mountain Electric Cooperative



Ivan Armstrong, Age 13
Route 1, Church Hill, Tennessee
Holston Electric Cooperative



Terry Mollinet, Age 13
Route 4, Smithville, Tenn. 37166
Caney Fork Electric Cooperative



Colleen White
Rt. 1, Box 397, Stanton, Tenn. 38069
Southwest Tenn. Elec. Memb. Corp.



Joyce Holloway
Rt. 3, Box 62, Hohenwald, Tenn. 38462
Meriwether Lewis Electric Cooperative



Brenda Pickett, Age 15
Route 1, Henderson, Tenn. 38340
Pickwick Electric Cooperative

Timely Topics

ALFALFA RETURNING NOW TO TENNESSEE

Alfalfa is still queen of the forage crops. It can be used for hay, silage, greenchop or pasture.

"It is a high yielding, high quality crop which holds a good stand for a number of years when recommended practices are followed," states Joe D. Burns, University of Tennessee Extension associate agronomist. "The alfalfa weevil is being controlled by a timely spray program."

Let's compare alfalfa with red clover, says the agronomist. Average yields per acre are 3.1 tons for alfalfa and 2.5 tons for red clover. The average crude protein is about 14 percent for alfalfa and 12 percent for red clover. The average digestible protein is about 10 percent for alfalfa vs. seven percent for red clover, and when the larger yield and higher digestible protein content are considered, the total digestible protein per acre is 620 pounds for alfalfa vs. only 350 pounds for red clover.

This difference equals 270 pounds digestible protein per acre, or about \$29.70 more digestible protein per acre. The extra six-tenths ton of hay would provide about 600 pounds of total digestible nutrients and another \$18 per acre. The total difference would be \$47.70 per acre in favor of alfalfa. This is the reason alfalfa is returning to Tennessee.

PROBLEM AREA MAY NEED A SOIL TEST

Have you ever noticed slow plant growth in different areas of a field?

Joseph N. Matthews, University of Tennessee Extension assistant agronomist, says that this condition may be the result of one or more possible soil fertility problems.

"Extremely acid soil is a major fertility problem in Tennessee," the agronomist states. "If the soil test shows a pH of 5.0 or below, then the problem is likely caused by toxicity from manganese and aluminum. The availability of these elements increases as the soil pH level decreases. This problem is called manganese toxicity."

The plant's growth is stunted and white spots or streaks appear, Matthews explains. These spots or streaks will turn brown and die at later stages of growth. It is difficult to correct a low pH before the crop is harvested, but it can be corrected before next growing season by applying agricultural limestone.

Problem areas also may occur on slightly acid, neutral or alkaline soils, Matthews continues. Examples of these problems may be zinc deficiency in corn and boron deficiency in cotton and alfalfa.

Lack of normal plant growth is not always due to fertility problems, concludes the agronomist. However, to be sure, ample problem areas and send the samples to the Soil Testing Laboratory, P. O. Box 11019, Nashville, Tennessee 37211 for analyses and recommendations.

FIELD DAYS SCHEDULED

The University of Tennessee Agricultural Experiment Station will continue to present a series of field days across the state this summer, announces John A. Ewing, Dean of the U-T Agricultural Experiment Station.

The field days are designed to bring to Tennessee farmers the latest in agricultural research findings and are presented to the farmers "on the spot," where much of the research has taken place.

Ames Plantation at Grand Junction will host a field day on July 16, at which such topics as cash crop production, fertilization, crop varieties, pest control and "low volume" spraying will be discussed.

The Milan Field Station on July 23 will have presentations on crop fertilization and varieties, tillage operation and soil testing. Also, land selection and machinery will be discussed.

At the Plateau Experiment Station at Crossville on August 5, experts in field crop production will discuss alfalfa, trefoil and soybeans. U-T horticulturists will tell about research with apples, tomatoes, peppers and blueberries. Beef cattle breeding and management will also be presented.

On August 7 at the Highland Rim Experiment Station near Springfield, research on beef cattle feeding, management and pastures will be reviewed. Tobacco breeding and management will be discussed, as will field crop production.

The latest research in burley tobacco will be presented at the Tobacco Experiment Station near Greeneville on August 12. Sucker and pest control will be discussed, as will fertilization and disease resistance.

USE BEST NUMBER OF MILKING UNITS

Milking machines on too many dairy farms are neither put on the cow's udder at the right time nor removed when they should be. One big reason for this is because one man tries to operate too many units.

"The machine should be attached 40 seconds to one minute after the cow is prepared for milking," believes Ray Spann, University of Tennessee Extension assistant dairy husbandman. "It should be removed just as soon as the milk stops flowing."

In one study when the machine was attached 40 seconds to one minute after washing, the cows milked out in an average time of 4 minutes and 51 seconds. When 1 to 3 minutes lapsed between washing and attaching units, the average milk-out time was 5 minutes and 31 seconds. The dairymen attaching the unit one minute after the udder was washed saved almost one minute per cow. On a 60 cow herd milking twice daily, this would be close to two hours per day saved.

Of course, the number of units that can be operated per man depends to a large extent on the man and the type of parlor, Spann points out. Generally, two units per man are enough in the double side opening or tandem parlors. Three are enough in the herringbone because less walking and door opening are involved.

The World of "Hams"...

The Hobby with a Heart

By C. H. Ward W4DFH
Mountain Electric Cooperative, Inc.

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dada —

What are those strange chirp like sounds you sometimes hear when tuning across the dial of a radio receiver? If you could read Morse Code, chances are you would find it to be an amateur radio operator.

And just what is an amateur or "ham" as we are often called? About the best way to describe this universal group is to say they are those who constantly experiment with radio equipment trying to improve and open new avenues to better communications. This elite fraternity is known to be the friendliest club in the world and has members throughout all nations.

New discoveries by hams are not uncommon. In 1958 two hams experimenting with a 650 watt transmitter bounced signals off the moon. Hams helped track our first manmade satellite, and discoveries in short wave by hams opened the way for TV and FM broadcasting. Excitement is nothing new for a ham.

From a few pioneers back in 1900, amateur radio has grown into an international fraternity. As far back as 1910 hams built workable sets and talked to others up to a mile away using crude sets made from model T spark coils and tin foil. After the regulation of communications by the Federal Communications Commission, many thought ham radio would be driven off the air, but instead it gave the operators an incentive to improve their equipment and procedures.

Ordinarily, amateur radio is a hobby, but aside from being a hobby many useful benefits derive from its members. Servicemen from around the world have been brought in contact with their loved ones by ham radios working with the Military Affiliate Radio Service (MARS). This service is manned by hams overseas as well as in the states. They receive and transmit messages using a device called a phone patch which makes it possible

to relay the message through a telephone.

A marine in Vietnam talks to his wife 12,000 miles away, while others stand in line waiting for their turn. A sailor at the south pole learns he is now a father of a son, or maybe a GI in Europe will receive a "Dear John" message. These are just a few of the many services by hams for our servicemen.

Not only do hams perform for the service but they maintain a national emergency network to provide communications during disasters. Many have stayed at their sets more than 40 hours to relay messages vital to a community. In 1927 one ham summoned aid for a helpless community by using doorbell batteries for power. In California a school boy sent out the first call for help after an earthquake wiped out all other communications.

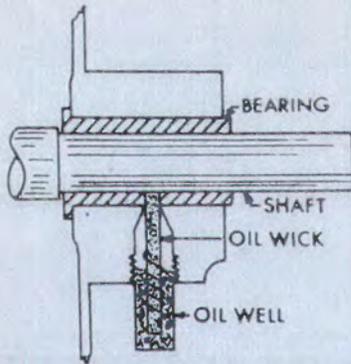
Where there is a need you will find amateur radio.

Ham operations are completely voluntary and those assisting, whatever the cause may be, receive no payment. Everything is done at their own expense. As for personal glory, seldom do those receiving aid know the names of the hams. They are identified only by their call letters and first names. Senator Barry Goldwater's ham station is manned 24 hours a day by volunteers and has handled many calls from servicemen, yet very few know when they are talking with him. Senator Goldwater says other than the "Dear John" messages, he loves this type of work. Another operator, a retired highway engineer of Carson City, Nevada, has helped more than 11,000 servicemen in Vietnam.

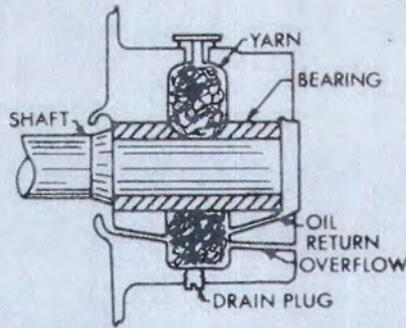
Even though the amateur receives no payment for his service, few hobbies offer more reward. The excitement of a mother's voice talking to her son after he had been reported missing is all the payment they need, says one ham. This dedicated and unselfish breed from all walks of life truly makes ham radio "a hobby with a heart."



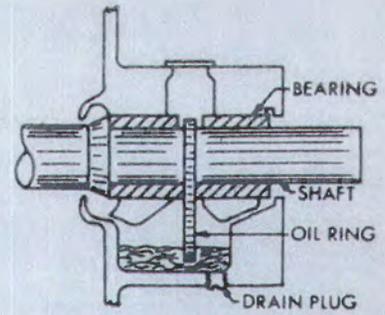
Mr. Leason Gregg, W4WNE, retired meter and radio superintendent of Mountain Electric Cooperative, makes another call on his ham station. Since this picture was taken, Leason has purchased a new station and has talked to hams in other countries. At present he does not have a phone patch but plans to get one in the near future. This station was a vital link for Mr. Gregg while his son was in service, talking with him many times.



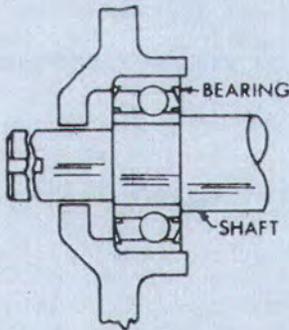
Oil-wick systems use a wick to carry oil up to the shaft. The oil well should be unscrewed, old oil cleaned out, and the well refilled about two-thirds full with new oil about twice a year, or more often, depending on use of motor.



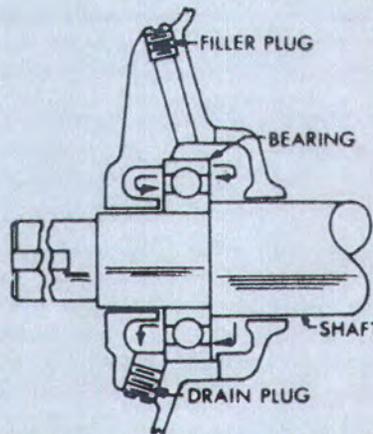
Yarn-packed motor uses a yarn-packed bearing to which a few drops of oil should be added every few months. If a drain plug is present at the bottom, accumulated oil can be drained off occasionally.



Ring-oiled system has oil carried from a reservoir below the bearing onto the shaft by a loose ring that turns as the motor runs. Old oil should be drained out, the reservoir flushed, and new oil added every two to three years.



Sealed motor is prelubricated and sealed by the manufacturer and should not be disturbed.



Ball-bearings, prelubricated type, can be relubricated either by disassembling the motor or through lubrication openings. Disassembled bearings should be wiped clean and repacked half to two-thirds full.

To assure long life, here's how to . . .

CLEAN ELECTRIC MOTOR CAREFULLY

Proper lubrication of electric motors means use of the right lubricant, in the right amount, and at the right time intervals. Manufacturer's directions should be followed closely. Common types of oiling systems used with sleeve-bearing motors are oil-wick, yarn-packed and ring-oiled. In general, a good grade of SAE 10 or 20 oil should be used for sleeve-bearing. Lighter or heavier may be used if temperatures are merely high or low.

Many general purpose electric motors have openings for ventilation. These openings allow dirt and

foreign matter to enter the motor and cause trouble with the starting of switch or brushes. Overheating may result from accumulation of dirt in the ventilation openings and wear is more rapid when dirt accumulates inside the motor. Motors should be inspected periodically to determine if a thorough cleaning is needed.

A simple procedure for cleaning most types of motors is as follows:

1. First, wipe outside of the motor to remove all dirt and grease.
2. Before starting to disassemble the motor, mark exact position of

the end shields on motor frame with a sharp center punch or file. This will permit proper reassembly for true bearing alignment. Care must be used in disassembling to prevent damage to parts.

3. Remove nuts and through bolts or cap screws holding the end shields and remove the rotor with its end shield. If the motor has brushes, these should be removed first to avoid breaking or damaging them when removing the rotor. Be careful not to tear the lead wires loose from motor windings. Use special care in removing ball bearings, if motor is so equipped.

4. Compressed air at low pressure may be used, if available, to remove dust and loose dirt from inside the motor. A soft brush or a vacuum cleaner may also be used to clean out loose dirt.

5. Remove grease and oil with a safe cleaning solvent applied with a paint brush and wipe clean with a cloth. Avoid using excessive amounts of solvent directly on the windings as the insulation may be damaged.

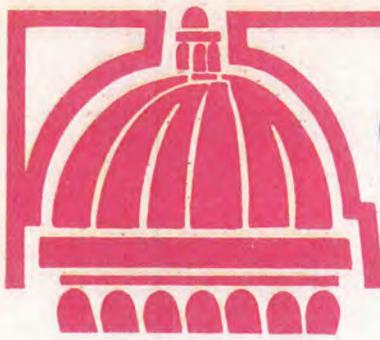
6. On motors with sleeve bearings, remove yarn or oil wick and wash out the oil well. It is advisable to replace the yarn or oil wick.

7. Repack ball bearings, if motor is so equipped. If ball bearings are sealed type, do not allow cleaning solvent to enter bearings.

8. After all parts have been cleaned, wipe dry with a clean cloth.

9. Reassemble the motor carefully. Tighten bolts or cap screws gradually and evenly, being sure end shields fit tightly all the way around.

10. Make sure the motor shaft turns freely and that motor leads are not in way of rotor fan or other moving parts.



Congress And The Farm Bill

By Jay Richter

Present farm legislation expires this year and the semi-annual debate is on. Exactly what will happen is still anybody's guess, but a veteran reporter on the Washington agriculture scene, Jay Richter, makes some general observations in a special report for THE TENNESSEE MAGAZINE. Richter is Washington correspondent for a number of farm publications and papers throughout the country.

Writing that big new farm bill up there on Capitol Hill is turning out to be an even more onerous task than usual for rural lawmakers. Their hangup is a familiar one, but it's proving tougher to get off the hook than in the past.

The problem is the constituent gap.

Views of the farm organizations have polarized around the American Farm Bureau Federation on the one hand, and the Coalition of Farm Organizations on the other. The vast distances between the farm policy views of these groups understandably disturbs the lawmaker who has to make a real run for re-election.

What the Coalition of 32 farm groups wants, briefly, is more of what we have now — an extension of present farm programs with "improvements" in the form of higher price guarantees. In a recent policy resolution, the Coalition, which includes the National Grange, the Farmers Union and the National Farmers Organization, called for "a renewed commitment to the preservation of family agriculture, the attainment of parity prices for agricultural producers, and the restoration of rural America."

The Coalition plan would add perhaps a billion dollars to present government price-supported program costs of roundly \$4-billion. Continuing and expanding present programs, the critics charge, simply will mean a still larger amount of the lion's share the rich, well-off, and medium income farmer is already getting in government payments. The poor farmer, they say, still won't have enough for a decent living.

The Farm Bureau's plan would phase out present grains and cotton programs within five years. To help maintain farm income, additional cropland would be retired at an annual average rate of 10 million acres. During the transition, the farmer who can't make it would be helped with "rural development" measures designed to get him a nonfarm job.

Critics of the Farm Bureau approach charge that it would drive down farm income, put the small family farmer out of business, and do irreparable damage to the economy of the rural community.

Who's a poor congressman to believe?

What he'll probably do, finally, is dot the i's and cross the t's on a bill that neither pleases those concerned nor drives them up the wall. The result, in short, is likely to be the traditional package that most people can "live with."

His life may or may not be complicated by the fluid-middle-road position being taken by the Administration which also has considerable political clout in his home territory. While the legislation promises to be similar to what we've had, it will bear some Nixon-Hardin tracks. These changes, generally, will introduce more flexibility into farm programs.

Here is what can be counted upon with "relative certainty."

(1) Actual dollar-cents guarantees to farmers will be maintained at about present levels for several years to come. The new law, however, will provide guards against escalation of government outlays for price supports.

(2) There will be provision for lower loans than now, in order to help meet foreign competition in export markets. But when loan levels are reduced, price-support payments will be raised to maintain over-all price support.

(3) The law will deal mainly with grains, cotton, dairy. Other commodity programs, notably those for tobacco, peanuts, and rice, will be largely unchanged. Wool support may be frozen at its present support level of 72 cents per pound. Soybeans will continue to be price-supported, and at levels generally lower than actual market prices. And, as now, soybean growers will be free of acreage controls.

(4) A ceiling is likely to be placed over the amount of government payments that may be made to any single farm. Twice, in the past, the House has approved a \$20,000 payment limit which subsequently was rejected by the Senate. The Senate probably will go along on a ceiling this time around, but it figures to be higher than \$20,000 — and considerably lower than the \$110,000 maximum (per crop) proposed by Agriculture Secretary Hardin.

(5) Provision probably will be written into the law allowing the Secretary to try the "set-aside" method of acreage control which he has proposed. The purpose is to allow the farmer more leeway in determining his cropping pattern. Acreage diversion would not be linked to particular crops as at present. Instead, the grower would set aside a certain amount of cropland on the whole farm, in addition to his conserving base. On the rest of his land, he would have "full freedom" to plant as he wished.

(Continued on Page 20)



How to avoid unnecessary service calls—and beat inflation



■ It's easy to avoid unnecessary appliance service calls.

How? Just be sure something's wrong with the appliance *before* you call a service technician.

Proof lies in the fact that appliance service companies report on automatic washers alone, about 40 per cent of first-year service calls could be avoided.

Service calls on most appliances could be avoided by following these two simple rules.

First, learn all you can about your appliance.

Second, check a few simple items before you call a technician. Not only is it embarrassing to have a serviceman tell you the machine isn't plugged in or that a fuse has blown . . . it can be expensive, too.

How do you learn about your appliances?

When you purchase an appliance, ask the salesman for the owner's manual and installation guide *before* the unit is delivered. Then sit down with a cup of coffee and read both manuals thoroughly.

The owner's manual is your textbook and the salesman and serviceman are your teachers. But it is your responsibility to use them. Ask questions. Don't be satisfied with the answers until you understand your appliance completely. And keep instruction books nearby for quick reference.

If you have lost your owner's manual, write the manufacturer. His address and model number (be sure to give the model number) will be stamped or printed on the appliance.

With proper use and care, you can expect years of trouble-free operation from your appliance. However, as any other machine, appliances may need occasional adjustment.

But, *before* calling the serviceman check these items. They are the most common sources of unnecessary service calls:

1. Electric cord. Is it plugged in? This does happen.
2. Power source. Has a fuse blown or a circuit breaker moved to the off position?
3. Controls. Are they set correctly? Be positive by checking your owner's manual. Give pushbuttons an extra firm push and turn dials in the proper direction.
4. Lights. If not on, check the power source. If the bulb's burned out, your owner's manual will tell you type of bulb needed for replacement.
5. Dust, lint and dirt buildup. This reduces efficiency. Washer filters (if not self-cleaning) and dryer lint screens need to be cleaned after each use. Dust and dirt can block your air conditioner filter. Check your owner's manual for instructions in changing or clean-

ing the filter. Dust and dirt will also build upon the coils, back and beneath refrigerators and freezers. They should be cleaned periodically with a brush or vacuum cleaner attachment.

6. Water supply. Is water flowing into the appliance? Be sure faucets are turned on and hoses not kinked.
7. Doors and latches. Are they properly closed? Most appliances will not operate correctly unless doors and latches are closed tightly.

That's how to avoid the most common unnecessary appliance service calls. However, specific appliances have operating parts that may pose questions in your mind. These will be answered in future articles.

If you've made the basic checks and read your owner's manual and the appliance still doesn't operate correctly . . . it's time to call for help.

But don't call any fix-it man down the street. Get the job done right. Call your dealer and ask him to recommend a manufacturer's authorized service technician . . . or contact the manufacturer directly.

Your university extension center, co-op home economist or county agent can be an additional source of information.

By avoiding unnecessary service calls, you'll save money. That's one way to beat inflation.

Remodeled Home (Cont'd)



Mrs. Barker is shown at work in her utility and sewing room. The large room is well lighted by fluorescent fixtures and offers plenty of space for sewing, ironing, washing and drying, and storage in the two large closets. All cabinets in the utility room have undercabinet lighting. Notice the built-in ironing board.

and over the new main floor. Mr. Barker and his boys did a lot of the work such as pulling wire, insulating, tearing out the old structure, etc. During construction Mr. Barker decided to tear off the old front porch and install six large colonial posts. All windows were reworked and storm windows installed.

Thomas Tenpenny, electrician for the job, pulled in over one and one-half miles of wire to supply electricity for the house. Two 50 gallon quick recovery water heaters were installed to offer

an unlimited quantity of hot water. The kitchen, planned by Mrs. Barker and Patsy Myers, home economist for Middle Tennessee Electric, has every electric feature available. The cabinets were custom made by Don McFerrin and Ed Thompson of Woodbury.

One of the biggest and most costly decisions was made when the family decided to brick the entire house with white brick. The two chimneys were cleaned and minor repairs made when the bricks were laid.

The house contains over 4000

sq. ft. of living space. It includes 4 bedrooms, living room, dining room, kitchen, den, utility, pantry, 4 baths, and a full basement which houses a two car garage. The structure, completed in the spring of 1970, is of white brick with black shutters and black roof. The house is carpeted throughout and provides a lovely setting for the beautiful antique furniture and furnishings. This is a house any family would be proud of; especially if you were born, reared, and lived all of your life in the house, as has Mr. Barker.



Mrs. Barker is shown looking at the dining room lighting fixture. This fixture was installed in the house in 1928. A little cleaning and re-wiring of the fixture made it like new. Note the bulb shape. Several of the bulbs which were originally installed in 1928 still burn. Matching bulbs were specially ordered.

FARM BILL (Cont'd)

(6) Land retirement on the "easement" plan suggested by Secretary Hardin probably will be allowed but only on a limited basis. The idea is for the government to buy cropping rights to whole farms, leaving title in the hands of farmers. They would agree to take land out of production "permanently." The contract would be binding not only on the producer signing it, but upon any succeeding owner. The owner would agree not to harvest any crop unless it were one that the Secretary had designated as "not in surplus." He could use the land, however, for approved wild-life projects. Contracts would be negotiated on a bid basis.

The typical Rural Electrification Administration electric borrower today is a cooperative, consumer-owned, locally managed, about 30 years old, serving nearly 5,000 consumers averaging about 3.5 per mile of line. In Tennessee, the average cooperative membership is approximately 15,000 with a density of some 6 members served over each mile of line.



RURAL HOUSING (Cont'd)

The importance of this legislation, not only to the welfare of small towns, but to the nation as a whole, is obvious. It is viewed favorably by the Administration and by members of both parties. In a very real sense H. R. 16813 and similar bills would provide a technical measure to remove an impediment to carrying out a program established by the Congress to meet a vital domestic need. It is legislation of major significance to millions of people.

1969 BURLEY CROP ADDS \$70 MILLION

By F. M. De Friese
Assoc. Ag. Economist
Univ. of Tenn. Extension

Final marketing reports indicate that the 1969 burley tobacco crop added around \$70 million to Tennessee gross farm income.

This was a drop of about \$4 million from the 1968 crop and reflects a smaller crop and a lower price. In the last ten years, only the 1966 and 1967 crops grossed less than the 1969 crop.

Kentucky with 422.2 million pounds accounted for 69 percent of the 1969 crop sales. Tennessee with 105.4 million pounds or 17 percent was second highest, followed by Virginia with 27.5 million pounds and North Carolina, 19.2 million pounds. All other states marketed 33.4 million pounds or 5.5 percent of the crop.

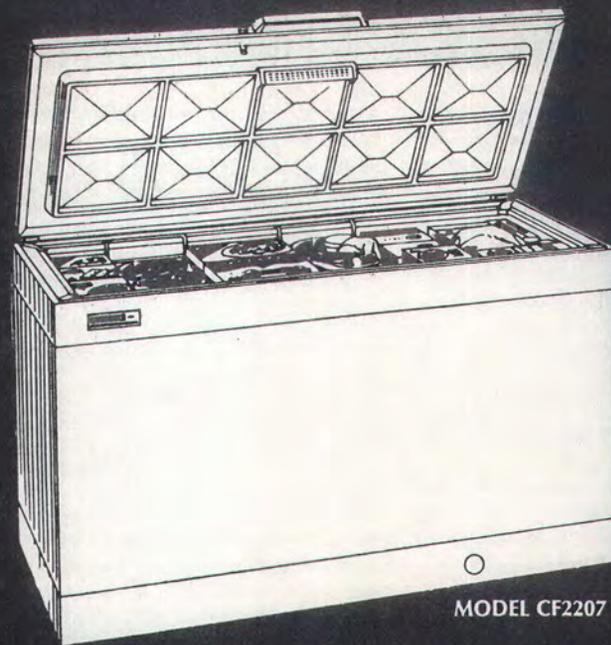
More than 26 percent of the gross sales of the 1969 burley crop was for tobacco placed under government loan. This compares with 9.7 percent for 1968 and was the largest since the 1954 crop when a record high of 31.7 percent of the gross sales was for tobacco placed under loan.

The lower price, the high percent of sales going under loan, the build-up of supply, and the general uncertainty with tobacco set the stage for the cut of approximately 10 percent in allotted acreage for the 1970 crop.

Not all growers in Tennessee received a cut due to the minimum acreage provision. The 1970 allotment for the approximately 87,000 burley growers was set at 49,837 acres. It will take a good yield with practically all the allotted acres grown and a price above 1969 to give Tennessee growers a \$70 million burley crop in 1970.

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PUZZLE CORNER

Puzzle Corner continued on its well-participated-in way in June, with hundreds of entries, most of which were correct.

The June puzzle concerned a tank with two pipes filling it and a third emptying it. One pipe could fill the tank in six hours, a second would need four hours to do the job while a third pipe could empty the tank in twelve hours. In other words, the tank, on an hourly basis, was filling at a volume rate of two-twelfths plus three-twelfths while losing at a rate of one-twelfth leaving,

per hour, a filling gain of four-twelfths (one-third) per hour. At that gain rate, the time to fill would give an answer of:

Three hours.

Winner of the June Puzzle Corner, chosen by lot, is Florence G. Henrick of Route 1, Green Brier, Tennessee 37073, a member of Cumberland Electric Membership Corporation, Clarksville. A check for \$10 from The Tennessee Magazine goes to this un-puzzler.

Second and Third prizes of \$5 each go to Milton Barret, Box 516, Copperhill, Tennessee, a member of Tri-State Electric Co-op, Copperhill, and to Mrs. Hazel Thornton, Spring Creek, Tennessee 38378, a member of Southwest

Tennessee Electric Membership Corporation, Brownsville.

And now for the Puzzle Corner for July:

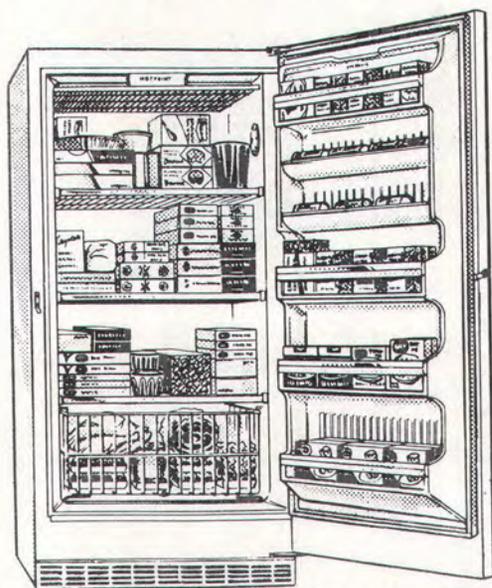
Imagine the bottom of the pendulum of a grandfather clock when it is hanging straight down and when it is at the top of its swing. If the horizontal distance by which the bottom of the pendulum is displaced is five (5) inches and the vertical displacement is one (1) inch, how many inches long is the pendulum?

Send your name, address, and name of your electric co-op to:

Puzzle Corner
The Tennessee Magazine
P. O. Box 7232
Nashville, Tennessee 37210



518 LB. FOOD FREEZER ON WHEELS

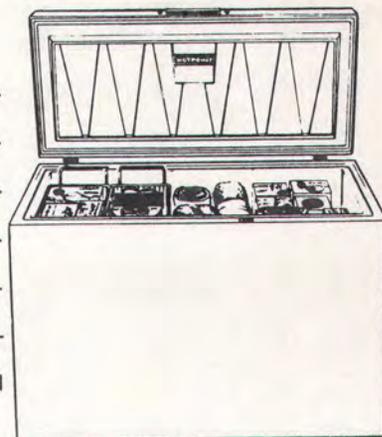


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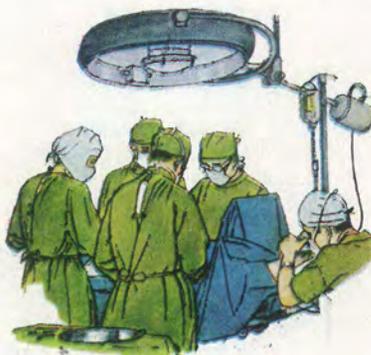
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