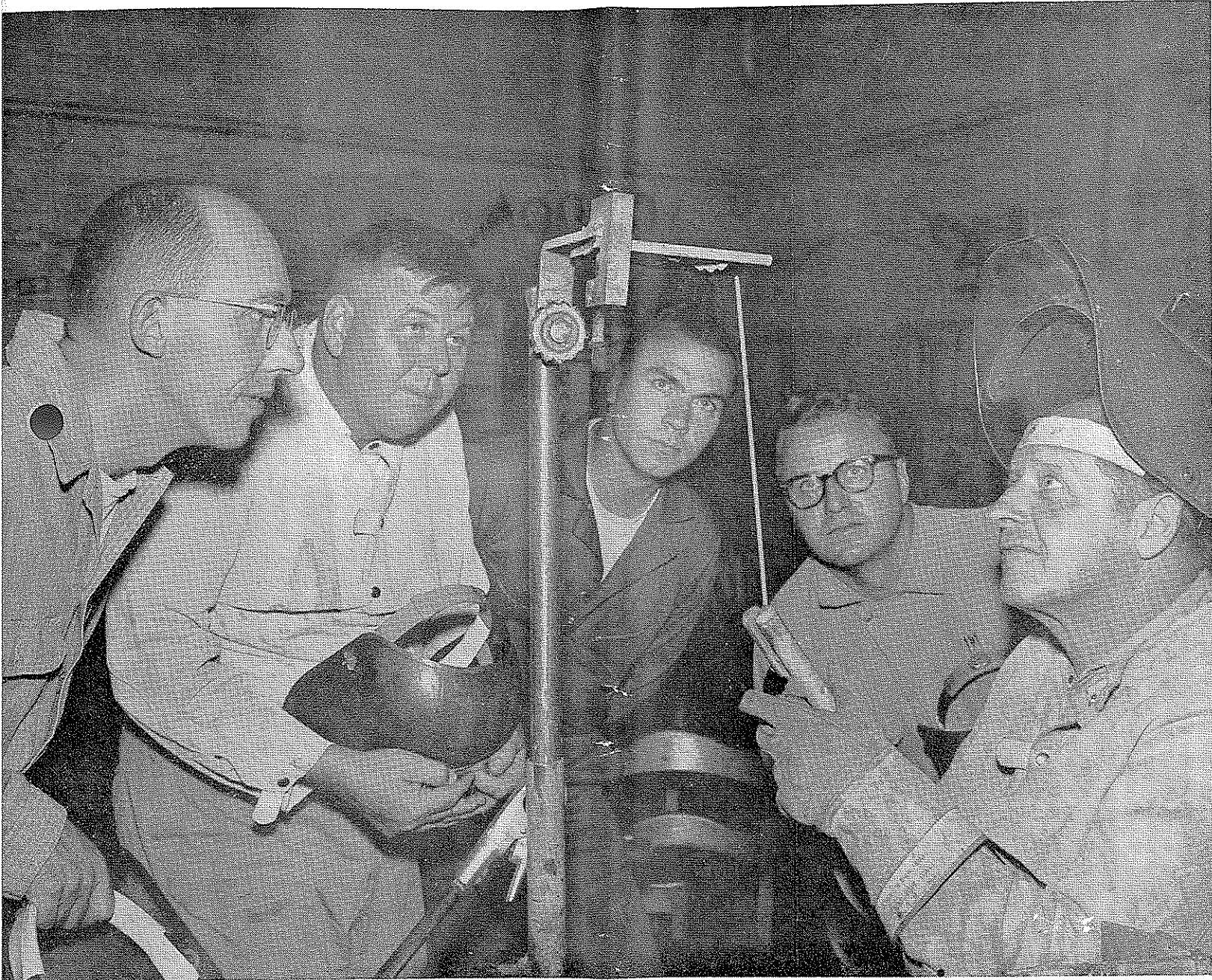


The **AGRICULTURAL EDUCATION** *Magazine*

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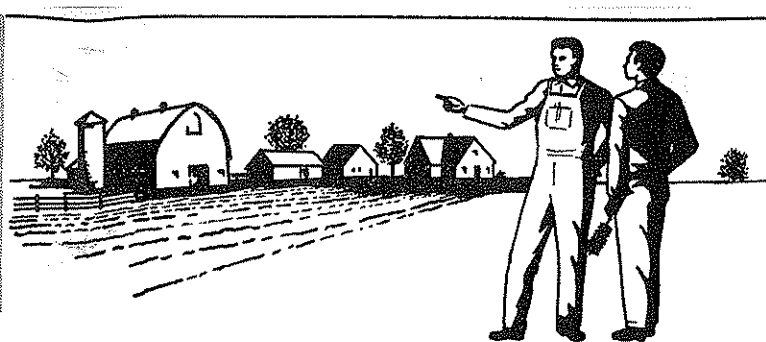
NUMBER 7



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*Featuring—*Is The Farm Mechanics
Program Keeping Up?

The Agricultural Education Magazine



A monthly magazine for teachers of agriculture. Managed by an editorial board chosen by the Agricultural Section of the American Vocational Association and published at cost by Interstate Printers and Publishers, Danville, Illinois.

THE INTERSTATE  DANVILLE, ILLINOIS

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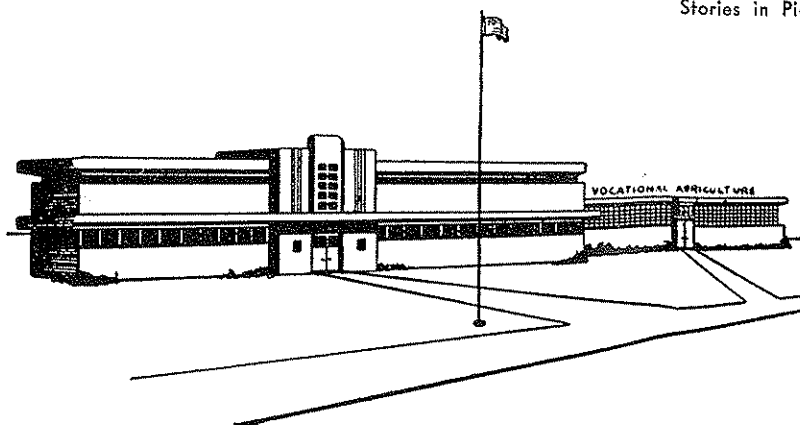
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Guest Editorials

Compulsive Consumption?

OTTO LEGG, Teacher Education,
Pennsylvania State University, University Park

Do you know a farmer who has recently purchased a \$6,000 combine for a 20 acre field of wheat? What prompted the purchase?

Vocational Agriculture teachers must help farmers to recognize sales pressures which are being applied, and how they influence farmers decisions. Farmers can be taught to distinguish between useful information and compelling promotion. They can be taught to evaluate sales motives and resist sales pressures.

Motivation for compulsive consumption creates tensions and dissatisfaction with existing equipment and is used to induce farmers to buy more. Much advertising does not provide information about necessities which are needed. It provides dreams that make the farmer dissatisfied with what he has. Experienced teachers can aid farmers to recognize the false economy of style, of status and of prestige compulsions. These human motives are played upon which create the desire to buy. Does the advice the teacher gives reflect his system of values? If the teacher's habits are to buy without too much reflection on the consequences, is he likely to advise farmers according to the same value system? Beginning teachers who may be indoctrinated to promote the purebred, the newest and the latest must be made conscious of and learn to develop a resistance to "motivational techniques" as they begin to teach.

Compulsion to buy, regardless of the source, has overpowered and reduced many farmers to failure. It is important to know what the best buys are, and where they may be obtained. Of equal importance is the ability of the educator to evaluate each farm situation and to aid the farmer in achieving a satisfactory successful business. Advancement in farming, a complete set of equipment, adequate buildings and a satisfactory type of livestock may be obtained without imposing an overload upon the farmer. Responding to wants and desires beyond economic ability may be prevented by skillful advice on the part of the teacher.

Developmental research which comes into the hands of opportunities is not likely to be a major improvement to agriculture. The area of automation is ripe for unscrupulous salesmen, possessed with the philosophy of planned obsolescence. Electric motors and switches left exposed to the wind, water and dust are sure to fail. Metal materials without adequate rust

Keeping Up with the Advances in Farm Mechanization

A. K. SOLSTAD, Department of Agricultural
Engineering, Univ. of Minnesota, St. Paul

What determines the course content in farm power and machinery in our vocational agriculture program? Are we trying to teach too much or should this be left to the "experts"? Are machines becoming so complex that we are being left hopelessly behind with no chance of ever catching up?

A partial answer can be found in the fact that mechanization expenses are reaching the 50% level of total farm costs. Over a recent 13-year period the Minnesota Farm Management Service found in 2613 sets of farm records that an average of 50.5% of the expenditures were in this area. Of this total, 17.8% was for farm power, 11.2% crop and general machinery, 2.8% livestock equipment, 8.6% buildings, fences, etc., 3.1% insurance and taxes (mechanization share), 9.7% interest on investment (mechanization share). The 522 most profitable farms showed a total of 46.7% expenses in mechanization while the 522 least profitable farms showed a higher figure indicating that the more efficient farmer kept expenses down in this area while still taking care of more work units per worker and keeping the mechanization expense per work unit lower than the less efficient operator.

In the past, vocational agriculture teachers were trained to build a bench hook, a nail box, a bread board or even perform an exercise in planing a small piece of wood. Are we to continue the pattern of having one woodworking bench for each student and including several welding booths for the additional increase in enrollment? Woodworking and welding are easier to teach and fit into the school class schedule. Also new construction is always more popular than repair and maintenance, but are we doing justice to our job of turning out top-notch farmers?

It has been estimated that 90% of our machines are out of adjustment all the time. Earl Zeltwanger, plow design engineer, of the Oliver Corporation says that the moldboard plow is the most abused machine in common use on farms. Likewise, it wastes more power through improper adjustment than any other machine. The average farmer could reduce fuel consumption 20% by proper hitching and adjustment.

Other benefits to be derived would include saving in time, replacement costs, improved crop production, trash coverage, etc. According to the Kansas Technical

Compulsive Consumption . . .

protection, too light in construction, or constructed from materials which cannot be repaired, are other examples of planned obsolescence. Building materials improperly protected from forces of decay are further examples of obsolescence built-in.

With planned obsolescence being built into products of family living and transportation, what is there to assure farmers that equipment they buy does not have the same built-in features? Obsolescence comes in one of several ways, by deterioration, by wear or by style change. Many machines of agriculture are taking on that "low sleek silhouette" with "three point hookup," necessitating changing everything that goes with it.

Have you ever wondered why some agencies have such a powerful sales force, but have inadequate or no repair facility and accompanied by "easy payment plans?" A reputable supplier will not represent himself as able to render service outside his demonstratable competence.

There are those who say that we must have planned obsolescence for our economy to expand. Planned waste is morally wrong. Farmers and teachers must be financially alert to prevent waste. Teachers must teach their students to meet these economic pressures and demands. Financial edu-

cation which can be given will have a direct transfer to related business or other life situations. The four partners to a sound agricultural business are the farmer, the banker, the supplier and the agricultural adviser.

Agricultural teachers and farmers have been aided by experiment stations as crops, machinery and methods are tested. However, rapid developments have prevented testing of all products. Experiment station information, understandably, is lagging development. Their publications lack the impact of these created through motivational research. Bulletins lack the color, the staff, and the financial backing to make their information equally provocative.

If we have been unaware of some of these forces about us, forces which we perhaps have aided unknowingly, let us learn to evaluate the worth of products and teach farmers to cope with these forces. When advertising materials are used as teaching aids, a critical analysis should be made of them.

Ethics of companies are suspect when public relations psychologists turn what has been discovered about "laws of learning" against consumers of their products. How many suppliers shed a tear over a farmer who goes bankrupt because he bought equipment not suited to his operation?

Agricultural educators must face this situation and evaluate marketing

devices, and information, and learn to cope with it. The following may be used as a guide:

1. Have you acquainted yourself with the farmer's total operation?
2. Do you know his operation well enough to advise him about the selection of his equipment?
3. Have you evaluated with him how much profit new equipment will return for his labor, added investment over taxes, interest, and depreciation?
4. In adding a piece of new equipment, do you know the efficiency of operation, the quality of workmanship, the efficiency of power? How much labor will it really save? What will the farmer use the labor he saves for? What is the estimated life of the equipment? Is its life predetermined by obsolescence deterioration? Is there reasonable freedom from breakage, resistance to wear and resistance to chemical deterioration? What sort of a guarantee does it have?

As an image of the vocational agriculture teacher is being created, let's help create one which casts him in a roll of adviser and defender of the farmer he is hired to assist and not as one who is promoting consumption. □

Keeping Up . . .

Bulletin 99, "A Study of Fifty Farm Tractors" by Reece and Larson, simple adjustment and maintenance increased maximum horsepower by 11.1% and decreased specific fuel consumption by 14.4%. A similar study at Illinois (Bulletin No. 624) on sixty farm tractors indicated that maintenance chores were being neglected. These changes involved items such as ignition timing, carburetor adjustment, spark plug adjustment, air cleaner maintenance and governor adjustment. Such adjustments can be taken care of with simple tools and equipment and do not involve any major overhaul, such as is sometimes suggested when a tractor is being considered for study in the vo-ag curriculum.

If we decide to take the initiative in this program, where do we begin? Everyone has an opinion, depending

on his background. The engineer thinks in terms of design. This is important because a faulty machine can be an expensive one. The repair man thinks of service such as the overhauling of a tractor and repairing a baler. The vocational agriculture department cannot justify the purchase of a valve grinder, but the removal of the cylinder head in the shop for a custom valve job means they should have a torque wrench for proper installation of the head afterwards. This also would be a good opportunity to teach the mathematics of torque or force times distance to produce a given twisting effort on the head bolts. The purchase of a dynamometer could also be considered, possibly in conjunction with another school.

Machine maintenance and adjustment, while seeming very simple and elementary, is important to high output and efficient operation and should

not be overlooked. According to the Kansas and Illinois tests, most air cleaner systems needed care and were seriously affecting both power and efficiency.

Those who have studied farm management are cost conscious and usually point out the need for decision making in terms of gasoline vs. diesel and size and type of machines to purchase as well as whether to repair or replace. All of these things are fine but the farmer needs the benefit of their advice either directly or through the vocational agriculture teacher.

Many variations in methods of teaching have been used by vocational agriculture teachers. Generally, we have begun in farm power with the teaching of principles in the classroom and then applied these (or hoped that they would be applied) on the job. With the new power testing

equipment available we may see this procedure reversed by testing a typical farm tractor and then analyzing the results. Most every teacher has used this latter problem solving approach in other areas. The same could hold true with crop machinery. A field trip may make as much sense at the beginning of the unit as at the termination to check on the results of the work.

The mechanics and mathematics of calibration of machinery needs more attention. This also can be taught either in the field, in the case of sprayers, or in the shop with drills and fertilizer spreaders.

Analyzing field losses is also important to the farmer to determine the effectiveness of his harvesting machinery. Most states have corn picking contests in which the vocational agriculture students take part. More training is needed in the mathematics of sample taking and the estimation of losses.

Research findings have been overlooked in many cases probably because much of the research in the past has been done by commercial com-

panies and results are not readily available. However, the projects in the USDA's Agricultural Research Service and the Land Grant Colleges are increasing in number and scope, thus adding to the wealth of information that should be passed on to the farmer.

Can the vocational agriculture teacher keep up with advances in farm mechanization? I believe that he can. Industry is very competitive and each organization tries to lead prospective customers to believe that it has something new and unusual with each change of model. There are changes, but not usually drastic ones. Rather, most are new adaptations of an old idea or different materials are used to improve the product or to increase production efficiency.

In teaching a mechanical, hydraulic or electrical principle, it is necessary to highlight basic information. This may be found in a text, an operator's manual, a service manual, or other manufacturer's literature such as sales sheets, charts and slides. Other possibilities include blackboard illustrations and models or working parts

(junk parts will often do). If practicable, it is usually best to have at hand the entire machine in which a part is used; for example, such components as the knotter on a baler, for which test stands and knotters are available from a dealer or distributor for trouble-shoot knotting difficulties, and ignition components on the tractor. Manufacturers will usually furnish unassembled parts at cost of manufacture plus postage.

Students also can contribute much material, though their selections may be of a superficial nature. However, asking a student to present a demonstration on a familiar machine, with an outline of material to be covered, is one way to generate interest in study and knowledge of his property.

Certainly the vocational agriculture teacher cannot be expected to be a specialist on every machine, but he can direct the study of these machines since he is expected to be a leader and an educator. The alert teacher will learn with his students and eventually he will be leading instead of lagging in this important area. □

Determining Farm Mechanics Instructional Needs at High School, Young and Adult Farmer Levels

PHILIP ROGERS, Vo-Ag Instructor, Caribou, Maine

Most vo-ag teachers could write down dozens of needs for instruction in farm mechanics for high school students, especially those of the first two years. Students of the 11th and 12th years are more mature and probably could be classed as young farmers.

Fundamentals are the backbone of any subject. When a 12 to 14 year old boy has chosen to study agriculture, it's the teacher's job to see that he is prepared to understand the farm mechanics part of his program. The young and adult farmers pretty much know what they want taught in farm mechanics.

If the instructor has a good sound program in farm mechanics for the day school student, word gets around to the young and adult farmer who may call wanting to know if he can

enroll in a day or night course. We have taught welding in night school for years and still some of the same men want more instruction.

It has been my experience that those having problems in any area of farm mechanics did not learn the fundamentals of that subject. Not being able to put to practice what one learns is tragic. Unfortunately we have a good many students of this nature.

Two prerequisites determine what will and can be taught—(1) shop facilities and (2) instructor's knowledge of his subject. Any program taught in shop becomes confusing when the instructor half does the job because of lack of equipment or knowledge.

Listed are a few of the important points in determining the needs of

teaching farm mechanics.

1. A teacher should know his area, type of farming and farmer. A teacher with long tenure has the advantage. One farmer in another area remarked, "We have had three vocational agriculture teachers in the last five years and I haven't known any of them including the present one."

2. Let them know you are going to have a night school by radio, newspaper, visitation, or through boys enrolled in high school.

3. Let them choose their subject of interest, since the farm problem that is immediately confronting them is their concern. Take the problems up in order of importance.

4. Use your advisory committee if there is one. If not, get advice from

a few of the more successful farmers and men associated with farming.

Due to the changes that have taken place in agriculture, namely, industrial, farm sizes, population and production, the instructional needs of high school, young and adult farmers are a challenge to the vo-ag instructor. Mechanization and automation certainly have brought about the need for technical instruction in farm mechanics.

This brings up a point. Where is the vocational agriculture instructor going to get the training that he needs so badly to teach this group? As I see it, it will have to come from (1) summer school workshops just for farm mechanics instruction, (2) courses sponsored by manufacturers, and (3) perhaps the most important—the instructor will go right to the local dealer and work on the machines. In our school we make arrangements with the dealers to send the machine (knocked down) to the shop, then the machine is assembled by the students.

The farm mechanic needs of high school students are probably different from those of young and adult farmers. Most young men of high school age need a good sound background of academic subject matter in physics, chemistry, math and science. Their needs are fundamental whereas, young and adult farmers want to know the care, operation and repair of their machinery. If the shop is equipped so that the instructor can do a good job of instruction with the day school students on basic fundamentals, then most of the young and adult farmers

in years to come won't have as many problems. Most problems stem from not understanding basic fundamentals.

Many phases of the farm mechanics program have to be reorganized each year to keep pace with the changes in design of machines. The fundamentals are the same but the designs do change.

The young and adult farmers know what they want. Their needs are more technical in nature. The trend in the near future, in this area at least, indicates that the most successful farmers will have shops equipped to do most of their technical repairs.

A survey of your area is a means of determining the needs of high school, young and adult farmers. The instructor must be on guard against using outlines developed for the high school students with the young and adult farmers. Several farmers studying welding wanted to know if the same course was taught to the high school students. I told them, "No! The adult course was more advanced!" They indicated that they didn't want to be classed as high school students. It was found that they very definitely needed more instruction even though they had been welding for some 12 years or more.

One very observant teacher remarked, "The farm mechanics instructor has more planning to do than any other teacher." Determining what to teach and making it meaningful is a skill and each skill has **KEY POINTS** that determine the success or failure of the job.

"Key point" is a term chosen to

represent whatever is the key to doing or choosing a step properly. They mean—(1) those things that make or break the job, (2) hazards and (3) things that make the job easier to do—"knack," "trick," "feel," "savvy," "special timing" or "bit of special information."

Examples of "key points": "knack," when nailing two boards together, an important point is to know when to stop pounding. The key to this point is to listen to the sound. The sound changes when the pieces are solidly together.

"Feel"—When putting a nut on a bolt, the key point is "how tight," a matter of feel.

"Timing and placing of heat"—When welding there are, among others, two key points—(1) applying the flame ahead of the weld and (2) getting the metal to the right heat, a matter of observing the color and behavior of the metal.

"Hazard"—When using a knife, the key point is to cut away from you.

"Special motion"—When using a hand plane, the key point is to carry your stroke clear through. Do not drag the plane backwards.

"Special information"—When disassembling an engine, disassemble in order. Mark special parts that must be put back in their respective places.

"Key points" coupled with "how to instruct," (1) prepare the student, (2) present the operation, (3) try out performance and (4) follow up, are the instructional needs of high school, young and adults farmers. □



Upgrading Welding Instruction in the Farm Shop

ARLYN W. HOLLANDER, Vo-Ag Instructor, Markesan, Wisconsin

It has been my observation as I have visited a number of Vo-Ag departments in various parts of Wisconsin that a high percentage of departments are attempting to construct welding projects without a proper background in the basic fundamental techniques. We do not expect students to reach the point where they are experts, but they should be proficient. Students should not have

to "grind" on a weld to make it "look" smooth.

Is your farm shop welding unit in vocational agriculture everything that you want it to be? Are you teaching your students a sufficient number of basic techniques? The student must be well grounded in the fundamentals of welding various carbon content steels and gray cast iron with both the arc welder and the oxyacetylene

welder. The student must also know how to identify the various kinds of metals that he will come in contact with. It is the opinion of the writer that the welding unit has the greatest potential of any of the shop units. In many cases it is not taught as effectively as it could or should be. It is granted that the Vo-Ag curriculum is a full one. But, we are told that we

(Continued on page 153)



A New Farm Mechanics Contest

CARL S. THOMAS, Teacher of Agriculture, Spencer, W. Va.

Three years ago I was asked by Mr. Joseph K. Bailey, Assistant Supervisor of Vocational Agriculture in West Virginia, to prepare a new kind of Farm Mechanics Contest to be used as part of our FFA Federation Spring Contests.

West Virginia is divided into eleven federations each of which has a "Field Day" or series of contests every year. In the Kanawha Federation, to which my chapter belongs, we now have Land Judging, Dairy Cattle Judging, Swine Judging, Dairy Products Judging, A Farm Crops Contest, An FFA Information Test, and a Farm Mechanics Contest.

For several years we had a Tool Identification Contest which usually consisted of fifty tools to identify and a Shop Judging Contest which consisted of shop projects in groups of four to be judged for workmanship. We were not completely satisfied with these contests but nothing had been done about them until three years ago. At that time I enlisted the aid of my co-worker, Mr. Bliss Hildreth, and started to prepare a completely new contest.

There were several things we wanted to incorporate in this new contest. We wanted to cover the five areas of Agricultural Mechanics as thoroughly as possible. These areas are: (1) Farm, field, and power machinery, (2) Farm electricity, (3) Farm shop, (4) Farm structures, and (5) Soil and water. In this new contest answers to each question are designated by a letter which the contestant should circle. This requires a minimum of writing and allows more time for additional questions. The questions are made as clear and concise as possible so that if a contestant is familiar with the problem he can answer without any complicated calculations. If the contestant is not familiar with the problem he has little chance of guessing correctly.

Example:

Find the number of board feet in the following bill of materials.

FFA Farm Mechanics Contest*

by Carl Thomas

Kanawha Federation, W. Va. Association of F.F.A.

Name _____ Chapter _____

Example:

- A yard is--
- A-12 inches
- B-24 inches
- C-36 inches
- D-48 inches

Circle Correct Letter

A B C D

Example:

Identify the following tools--

- Claw Hammer
- Ball Peen Hammer
- Half Hatchet
- Tinners Hammer

A B C D

A B C D

A B C D

A B C D

1. Find the number of board feet in the following bill of materials.

A B C D

3 pcs. 2" x 6" x 10' (Figure here)

- A-10 bd. ft.
- B-20 bd. ft.
- C-30 bd. ft.
- D-None of these

2. Find the cost of the above bill of materials if lumber sells for \$150.00 per 1,000 board feet. (Figure here)

A B C D

- A-\$1.50
- B-\$3.00
- C-\$4.50
- D-None of these

3. Which cold chisel shown is sharpened properly for general purpose work?

A B C D

4. A motor with a 3" pulley running at 1725 RPM will drive a machine with a 4" pulley about-- (Figure here)

A B C D

- A-2300 RPM
- B-1293 RPM
- C-1565 RPM
- D-1962 RPM

5. Identify the nails shown.

- Common Nail
- Box Nail
- Finishing Nail

A B C D E F G

A B C D E F G

A B C D E F G

*The author would be glad to provide interested persons with a copy of the contest material.

3 pcs. 2" x 6" x 10'

A-10 bd. ft. C-30 bd. ft.

B-20 bd. ft. D-None of these

We attempted to avoid the use of tricky or misleading questions. On some questions, however, where students may figure backwards or fail to locate the decimal correctly we included a wrong answer choice that could possibly agree with their figures.

Examples:

A motor with a 3" pulley running at 1725 RPM will drive a machine with a 4" pulley about-

A-2300 RPM C-1565 RPM

B-1293 RPM D-1962 RPM

A field 325 feet wide and 871 feet long will contain approximately-

A-1.3 acres C-13 acres

B-6.5 acres D-65 acres

Some parts of the contest are questions which are complete on the contest blank such as the examples given previously. Other parts are actual shop items or tools laid on tables for the contestant to give some information concerning them or to be identified.

Examples:

The mower section shown is-(Actual object)

A-all right D-broken

B-dull E-incorrectly sharp-

C-worn out ened

Which cold chisel shown is properly sharpened for general purpose work? (Four sample chisels)

A B C D

Another method employed is the use of pictures and diagrams of objects too inaccessible for an indoor contest.

Examples:

In the sketch shown, the per cent slope is-

A- 6% C-12%

B-10% D-50%

Identify the structural forms of the buildings shown.

Arch A B C D E F

Crib A B C D E F

Gable A B C D E F

Cambrel A B C D E F

Shed A B C D E F

Silo A B C D E F

FFA Farm Mechanics Contest (Continued)

Corrugated Nail	A	B	C	D	E	F	G
Casing Nail	A	B	C	D	E	F	G
Flat Head Wire Nail	A	B	C	D	E	F	G
Wire Brad	A	B	C	D	E	F	G

6. A field 325 feet wide and 871 feet long will contain approximately- (Figure here) A B C D

A-1.3 Acres

B-6.5 Acres

C- 13 Acres

D- 65 Acres

7. Identify the saw teeth shown-
 Hand Rip Saw Teeth A B
 Hand Cross Cut Saw Teeth A B

8. Identify the parts of an engine shown in the picture. (Some parts not shown)

Cylinder	A	B	C	D
Piston	A	B	C	D
Rocker Arm	A	B	C	D
Cam Shaft	A	B	C	D
Flywheel	A	B	C	D
Connecting Rod	A	B	C	D
Crank Shaft	A	B	C	D
Drive Shaft	A	B	C	D

9. In the sketch shown the percent slope is-
 A- 6%
 B-10%
 C-12%
 D-50%

10. Identify the woods shown-

Black Walnut	A	B	C	D	E	F	G	H
Beech	A	B	C	D	E	F	G	H
Oak	A	B	C	D	E	F	G	H
Poplar	A	B	C	D	E	F	G	H
White Walnut	A	B	C	D	E	F	G	H
Maple	A	B	C	D	E	F	G	H
Fir	A	B	C	D	E	F	G	H
Cherry	A	B	C	D	E	F	G	H

11. The mower guard shown-
 A-Is all right
 B-Needs replacing
 C-Needs adjusting
 D-Needs sharpening
 E--Needs new plate

12. Identify the switches shown-

Single pole switch	A	B	C	D	E	F
Double pole switch	A	B	C	D	E	F
Three way switch	A	B	C	D	E	F
Feed through switch	A	B	C	D	E	F
Motor Control switch	A	B	C	D	E	F
-Toggle switch	A	B	C	D	E	F

13. In picture shown the diameter between Points A and B of a 10 x 28 tractor tire is-
 A- 10 inches
 B- 28 inches
 C- 38 inches
 D- 48 inches
 E-280 inches

FFA Farm Mechanics Contest (Continued)

14. One horsepower equals 33,000 foot pounds per minute; therefore, to lift a 66,000 pound load two feet in one minute would require—
 A—½ Horsepower
 B—1 Horsepower
 C—2 Horsepower
 D—4 Horsepower
15. Identify the bolts shown—
 Carriage bolt
 Machine bolt
 Stud bolt
 Stove bolt
 Toggle bolt
16. The mower section shown is—
 A—All right
 B—Dull
 C—Worn out
 D—Broken
 E—Incorrectly sharpened
17. Identify the screws shown—
 Wood Screw
 Lag Screw
 Cap Screw
 Sheet Metal Screw
 Machine Screw
 Set Screw
18. In the picture they are checking the—
 A—Cutter bar alignment
 B—Cutter bar lift
 C—Cutter bar lead
 D—Straightness of cutter bar
19. Identify the samples of sheet metal shown—
 Galvanized
 Black Iron
 Stainless Steel
 Copper
 Aluminum
 Brass
20. The picture shows the right and wrong—
 A—Guard adjustment
 B—Knife register
 C—Knife holder adjustment
 D—Knife grinding
21. The mower section shown is—
 A—All right
 B—Dull
 C—Worn out
 D—Broken
 E—Incorrectly sharpened
22. Identify the nuts shown—
 Wing nut
 Chamfered hex nut
 Plain square nut
 Cap nut
 Castellated hex nut
 Chamfered and washer faced hex nut
 Chamfered square nut

Since the contest was to be given at different places, a special effort was made to keep it compact. This was accomplished by using pictures and diagrams and the smaller sizes of tools and supplies where the actual object is shown. The result is a contest that may be carried, along with 200-300 copies of the contest blanks, in a large brief case.

The original contest was used in a number of federations over a two year period. Last year it was changed and lengthened to 100 possible points. About 35 minutes are required to complete the new contest.

I am now in the process of revising and improving it for future use.

The presently used contest blank accompanies this article.

Upgrading Welding . . .

(Continued from page 150)

will see as many new developments in farm machinery in the next ten years as we saw in the last 25 years. I do not think that anyone will deny that farm machinery repair is going to be an ever important subject in this era of farm mechanization. In addition, we do not have a repair shop or blacksmith shop in every hamlet of the country. More and more farmers are realizing that they must be able to maintain and repair most of their own machinery and equipment. Break-downs that can be repaired in the home farm shop mean less "down time." It means that the crop can be harvested when it is ready. Then too, the farmer's ability to do shop work on the farm may mean the difference between profit and loss in the total farm operation.

By being able to do his own repair work the average farmer can save at least \$200 a year on his repair bill. If ten students each year, who remained on farms, could do most of their own repair work it would amount to \$2,000 a year for each class. What additional shop equipment and how big a budget for steel is needed to upgrade welding instruction? Let us first consider the equipment needed. We find that a B-3 Beverly Shear, or its equivalent, is needed to cut the hot rolled strip in 12 and 14 gage thickness which is used for fusion welding of steel with both the oxyacetylene welder and the arc welder. A power hack saw is needed to cut up steel stock for weld-

(Continued on page 154)

FFA Farm Mechanics Contest (Continued)

23. In the picture they are—
 A—Adjusting the points
 B—Cleaning spark plug
 C—Filing the points
 D—Checking the gap
24. Identify the tools shown—
 Cold Chisel A B C D E F G
 Diamond point chisel A B C D E F G
 Cape chisel A B C D E F G
 Nail set A B C D E F G
 Drift punch A B C D E F G
 Drive pin punch A B C D E F G
 Center punch A B C D E F G
25. The mower guard shown—
 A—Is all right
 B—Needs replacing
 C—Needs adjusting
 D—Needs sharpening
 E—Needs new plate
26. In the sketch shown the pump must lift the water—
 A— 8 ft.
 B—16 ft.
 C—18 ft.
 D—None of these
27. Lubrication—
 A—Keeps wearing surfaces together
 B—Acts as a cooling agent
 C—Increases friction
 D—None of these
28. The primary purpose of a carburetor is to—
 A—Filter dirt out of fuel
 B—Filter dirt out of air
 C—Mix fuel and air
 D—Mix fuel and oil
29. In the drawing shown Part No. 1 marked with an arrow is called a—
 A—Bevel
 B—Chamfer
 C—Dado
 D—Edge Bead
30. Identify the knots and splices indicated—
 Crown knot A B C D E
 Crown splice A B C D E
 Eye splice A B C D E
 Loop splice A B C D E
 Short splice A B C D E
31. A good concrete mix for most farm construction jobs would be—
 A—1 part gravel
 2½ parts sand
 3 parts cement
 B—1 part sand
 2½ parts cement
 3 parts gravel
 C—1 part sand
 2½ parts gravel
 3 parts cement
 D—1 part cement
 2½ parts sand
 3 parts gravel

Upgrading Welding . . .

ing various kinds of joints with the arc welder. A power hack saw using blades 12" long and capable of handling stock up to five or six inches wide is satisfactory. In addition a heavy duty grinder of one horse power is necessary for preparation of joints. In small shop classes a ¼ horse power capacity may suffice. We have two heavy duty grinders, each of one horse power, requiring one inch by ten inch wheels. To supply the three pieces of equipment would require an investment varying between \$600 and \$750.

Let us take a look at the kind of projects taught so we can get an idea of the investment in steel stock needed to keep a well-grounded basic techniques course in operation each year.

Our first job on the arc welder is to teach padding. Then we follow with lap joints, "T" joints, edge and corner joints, and finally butt joints. For padding, ½" flat stock from 2½" to 3" wide is most satisfactory. Pieces are cut 4" to 4½" long in the power hack saw or with the cutting torch. We like to use pieces ½" thick, 3" wide and 4½" long. With either a 1/8", 5/32", or 3/16" electrode, speed of travel can be adjusted to make two passes while going the long way and three passes the short way.

For lap joints we use ¼" flat stock, 3" wide and cut pieces 3½" long. This enables the student to lap 5 thicknesses, or 1¼", and have 1" in the center. Joints are tacked on the end and then welded on both sides with one pass of a 5/32" electrode. Material is saved by adding lap joints on either end.

To weld "T" joints we use ¼" flat stock, 3" wide—but the pieces are cut 4" long. A root pass is welded on each side. Then follow with multiple passes, alternating sides, as 2 passes over 1; 3 passes over 2; and, 4 passes over 3. To prevent "gutting out" on one end, alternate direction of travel—that is, put the first pass on from left to right. The 2 passes over 1 go on from right to left. Then, the 3 passes over 2 are put on from left to right. Students should be able to weld from either direction with equal ability. "Cutting out" can also be prevented by tilting the electrode over at a 45 degree angle as you come to the end of a joint and holding it close to the work. Two pieces of steel for a "T" joint will keep a student busy all period, with two students per welder.

Upgrading Welding . . .

We also use 1/4" flat stock 3" wide for butt joints. Pieces for butt joints are cut 3" long. Butt joints need to be beveled by grinding. On flat stock 1/4" thick, leave 1/16" of parent stock. Butt joints are the most difficult for students to master. Proper grinding, lining up or spacing, and tacking are of extreme importance. On the table place two flat pieces of metal with an opening of about 3/4". The two pieces for the joint are placed above this opening. A 3/32" spacing is used and a 3/32" electrode is used to weld the root pass. Penetration must be secured on the first pass. All slag must be chipped and brushed out between passes. The second pass is welded with a 1/8" electrode, welding from right to left. The last pass is

welded from left to right using a 5/32" electrode with not over 10% build up over thickness of base metal. Again, alternating direction of passes prevents "gutting out." Butt joints should be welded all from one side. The student should not have to turn the joint over and put on another pass to get what was the bottom to look good. Joints can be checked by cutting open with the power hack saw; or, fast cooling after each pass will crystallize the weld. Put in a heavy duty vise and strike a blow with a hammer and the joint breaks rather easily. (Note: Fast cooling is never done on actual repair jobs.)

On corner joints we use much thinner metal. Twelve gage hot rolled strip, 3" wide is used. Our project is to make a small box approximately 6" long, 3" wide, and 3" high. Three

pieces are cut 5 and 3/4" long. We use channel for backing and "C" clamps to clamp the pieces to the channel. For this job a piece of 4" channel, 8" long, spotted to the edge of the welding table will do. The top of the channel should be in the up and down position. If available, larger channel is more satisfactory. In welding the box, be sure that welds are on the bottom, or one side will be higher than the other. Ends are cut with the shear and fitted so a flush corner joint is welded. One end is welded with the arc welder—the other with the oxyacetylene welder. Be sure to tack all corners before welding. Practice for this exercise by using shorter pieces, clamped on to the channel.

To practice edge joints, use two pieces of 12 gage hot rolled strip 3" long and 3" wide. Clamp the two pieces together, prop up on one edge, and weld opposite edges. It will take a weaving motion and a fairly fast rate of travel, depending upon amperage setting.

On the oxyacetylene welder we use 12 gage hot rolled strip, 3" wide to do the exercises. Fourteen gage hot rolled strip is almost as satisfactory, but 12 gage works better for making that part of the previously described metal box with the arc welder. The metal boxes, 6" x 3" x 3", made the previous year to gain experience with corner joints, are used to teach running beads with the oxyacetylene welder. We use a 3/32" copper coated steel rod or wire. It is much more economical to learn the proper technique and synchronization of dipping the rod in the puddle to make the bead, with this exercise. All other jobs, including bronze welding and hard surfacing will come so much faster and easier. It is also much cheaper in the long run.

We also use 12 gage hot rolled strip to teach welding of lap joints, edge and corner joints, and butt joints on the oxyacetylene welder. Pieces are cut on the sheer, and should be flattened out on the face of the anvil. Lap joints are lapped 5 T, or about 3/8". One must be sure that students obtain penetration on the upper and lower edge of the weld. Condition of the flame, speed of travel, and frequency of dipping the rod are under control of the student. Corner joints are practiced by cutting pieces 1 1/2" wide, flattening out, and propping the two pieces up at or near right angles and welding a half open corner joint. Edge joints can be

FFA Farm Mechanics Contest (Continued)

- | | | | | | | |
|--|---|---|---|---|---|---|
| 32. A bag of cement contains— | A | B | C | D | E | |
| A—100 lbs. | | | | | | |
| B—1 cubic foot | | | | | | |
| C—80 lbs. | | | | | | |
| D—1 cubic yard | | | | | | |
| E—None of these | | | | | | |
| 33. In the pictures shown, the proper group to use for soldering electric wiring is— | A | B | C | D | | |
| 34. A ruler graduated in sixteenths of an inch would read similar to the one shown. Which one of the graduations is wrong? | A | B | C | D | E | |
| 35. Identify the structural forms of the buildings shown— | | | | | | |
| Arch | A | B | C | D | E | F |
| Crib | A | B | C | D | E | F |
| Gable | A | B | C | D | E | F |
| Gambrel | A | B | C | D | E | F |
| Shed | A | B | C | D | E | F |
| Silo | A | B | C | D | E | F |
| 36. The drawing shown is a house— | A | B | C | D | | |
| A—Foundation layout | | | | | | |
| B—Floor plan | | | | | | |
| C—Blue print | | | | | | |
| D—Architect's model | | | | | | |
| 37. The picture shows a single cylinder of a— | A | B | C | D | E | |
| A—Four cycle engine | | | | | | |
| B—Four cylinder engine | | | | | | |
| C—Two cycle engine | | | | | | |
| D—Two cylinder engine | | | | | | |
| E—None of these | | | | | | |
| 38. In the picture shown it would require approximately _____ pounds pull at point "B" to lift weight "A" | A | B | C | D | E | |
| A— 50 | | | | | | |
| B— 75 | | | | | | |
| C—100 | | | | | | |

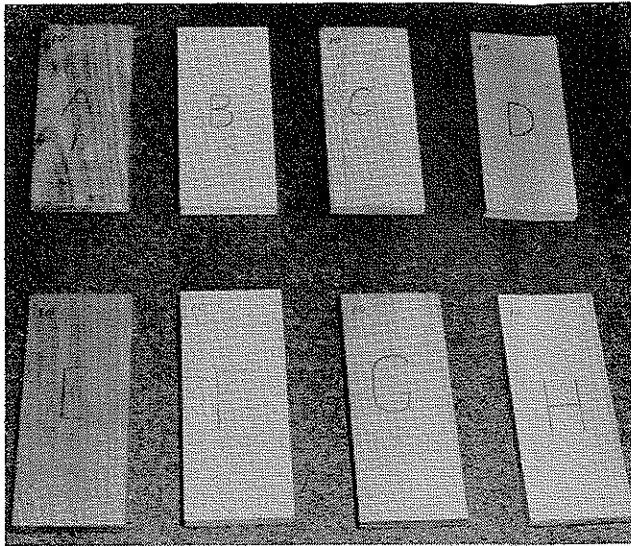
FFA Farm Mechanics Contest (Continued)

- D-150
- E-None of these

39. Identify the abrasives shown--

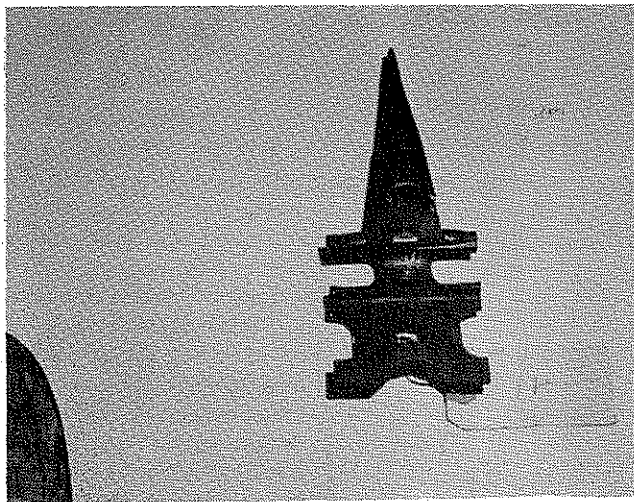
- | | | | | |
|--------|---|---|---|---|
| Emery | A | B | C | D |
| Flint | A | B | C | D |
| Garnet | A | B | C | D |
| Pumice | A | B | C | D |

The following two items are sample illustrations from the contest. The number refers to the question in the contest material:



10. Identify the woods shown--

- | | | | | | | | | |
|--------------|---|---|---|---|---|---|---|---|
| Black Walnut | A | B | C | D | E | F | G | H |
| Beech | A | B | C | D | E | F | G | H |
| Oak | A | B | C | D | E | F | G | H |
| Poplar | A | B | C | D | E | F | G | H |
| White Walnut | A | B | C | D | E | F | G | H |
| Maple | A | B | C | D | E | F | G | H |
| Fir | A | B | C | D | E | F | G | H |
| Cherry | A | B | C | D | E | F | G | H |



11. The mower guard shown--

- A-Is all right
- B-Needs replacing
- C-Needs adjusting
- D-Needs sharpening
- E-Needs new plate

Upgrading Welding . . .

welded with the same procedure as with the arc welder in terms of setting up and clamping. Butt joints with the oxyacetylene welder require correct technique. A 3/32" copper coated steel rod is used with a 3/32" spacing between the two pieces. Both ends are tacked, and then welded from right to left. To secure penetration do 1/8" to 1/4" of the joint and depress the flame into the joint to gouge out a miniature horse shoe. Proceed in this manner until the joint is completed. When cooled, use the shear to cut the weld out. Cut 1/8" to 1/4" from the edge of the weld, flatten remaining pieces out and use again. Butt joints can be checked by putting in a vise and bending around.

After spending three or four weeks on basic fundamentals, we are ready to start welding gray cast iron with both arc and oxyacetylene. We use the machineable nickle rod and the nonmachineable rod for fusion welding of gray cast iron on the arc welder. On the oxyacetylene welder we teach both fusion welding of gray cast iron and bronze welding. Of course bronze welding is faster, requires less oxygen and acetylene, and fewer distortion problems.

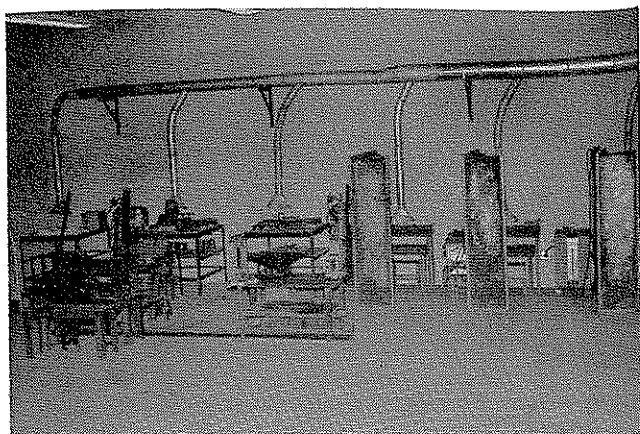
While the oxyacetylene welders are used for bronze welding of gray cast iron, verticle up and down welding of steel is taught with the arc welder. The use of the carbon arc torch is also taught. In farm machinery repair, hard surfacing with both the arc and oxyacetylene welder is taught.

To teach cutting on both the arc and oxyacetylene units, butt joints, made previously, are tacked or welded together to form longer pieces. The same is true with lap joints. Lap joints are used when cutting with the arc and the butt joints are used when cutting with the oxyacetylene cutting torch.

How much material is needed and what is the cost per student to carry on a course of this type? On arc, "T" joints require 4 pieces 4" long; butt joints 8 pieces 3" long; and, lap joints 4 pieces 3 1/2" long. This is all 1/4" flat stock, and for each student it would require 4 1/2 feet of 1/4" stock 3" wide. This stock weighs 2.55 lbs. per ft., or approximately 11.5 lbs. For padding on arc, one piece, 1/2" x 3" x 4 1/2" will weigh about two lbs. For hot rolled strip, 12 gage, 3" wide, it would require per student--6" for lap joints, 6" for corner joints, 6" for

(Continued on page 157)

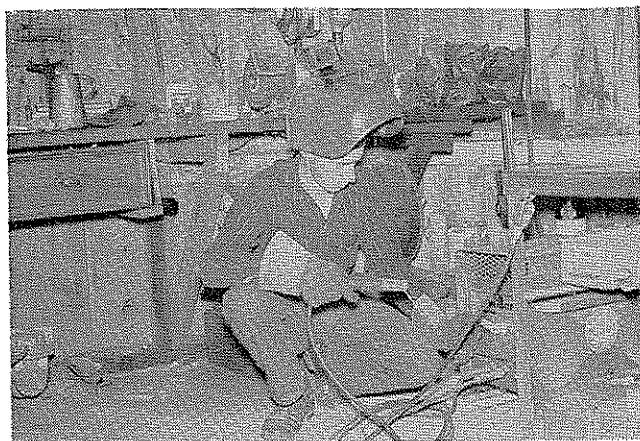
Upgrading Welding . . .



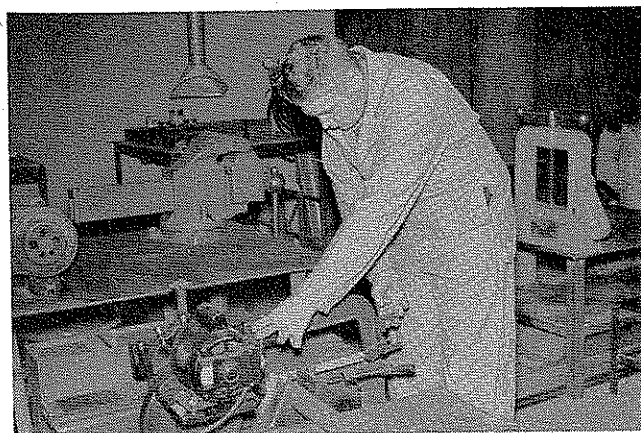
The welding set up in the farm shop, Markesan District Schools. There are three arc welding units and three oxyacetylene units (one is a double unit).



Shows student, Walter Affeldt, cutting 12 gage hot rolled strip with a B-3 Beverly Shear.



Bobby Bosveld, American Farmer Degree, 1960, is shown in his shop adjusting amperage on his welder, prior to working on a repair job.



Walter Affeldt cutting off a piece of $\frac{1}{4}$ " x 3" flat stock with the power hacksaw. On the left table is a rod cutter and heavy duty vise; on right table, large pipe vise and heavy duty vise.

edge joints, 6" for butt joints, and 2 feet for the metal box 6" x 3" x 3". Figuring 4 ft. per student, and 1.11 lbs. per ft., is approximately 4.5 lbs. This makes a total of 18 lbs. of steel per student for basic jobs. At wholesale price, averaging \$.15 per lb., this is a total of \$2.70 for steel.

Cast iron is purchased from the junk dealer for the same price as he receives at the scrap yards. In addition, I am able to pick out the size and thickness of gray cast iron pieces that best suit our needs. Scrap

cast iron would not be over \$.30 per student. It costs about \$3.00 per student for both oxygen and acetylene. Electrodes for arc welding cost about \$2.00 per student. For oxyacetylene welding, bronze rod, copper coated steel rod, and cast rod for fusion welding gray cast iron would cost another \$2.00 per student. Figuring up, we find that this basic welding course costs the school district \$10.00 per student.

Is \$10.00 per student, too much money to spend on a basic funda-

mental unit? Not when the average farmer can save \$200 a year on his farm machinery repair bill. A basic fundamental course of this type will upgrade welding instruction in your farm shop. Students will be proficient. Welds will not have to be ground to make them look smooth. Students will have a well-grounded knowledge of welding steel and cast iron of varying thickness in a variety of positions. Just as important, he will know the repair jobs he is capable of doing himself and which ones require skilled experts. □

FUTURE THEMES

February—Administering the Vo-Ag Program

May—Planning for the Summer

March—The FFA, Past and Future

June—Improving the Quality of Farming Programs

April—The Vo-Ag Teacher's Role in Guidance

Teacher Training Responsibilities of Agricultural Engineering Departments¹

R. H. DRIFTMIER²

Ability and responsibility are commensurate. To whom much is given, of him much is expected. Powers, abilities, capacities, and possessions measure our responsibility. We are answerable for what we are and have, not for what others are and have. Too often we forget this and spend more time thinking about the other man's responsibilities than we do our own. This is true, all too often, in education. We are inclined to criticize others for their inadequacies, with no blame to ourselves of course. (It's much easier to criticize, you know, than it is to be correct.)

Just as it is true that the primary responsibility of any institution of higher learning is teaching, it is also true, I believe that the educational program of any Agricultural Engineering Department should be broad enough in scope to include service courses, at both the undergraduate and graduate level, for all fields related to agriculture.

Such courses should be directed toward the *needs* of agricultural workers who are interested in the production and primary processing of crops and livestock; in extension and vocational agriculture; in soil conservation; and in sales and other work that deals directly or indirectly with farm and urban life.

With the almost complete mechanization of agriculture, the students enrolled either in agriculture or vocational agriculture should have an acquaintance with the economic application of agricultural machines and power; with electric power and processing; with rural housing, farm structures, and utilities; and with soil and water conservation, including drainage, irrigation, and land development. In my judgment, the courses covering these subjects should be presented from the viewpoint of the user

and consumer rather than from that of engineering design. Increasingly, through surveys³ and consultation, such courses should be continuously revised and developed on the basis of the *problems* and *needs* of those we serve.

We presently offer ten undergraduate courses and two graduate service courses. (The courses in which Vo-Ag majors would be interested do not have any prerequisites.) At the undergraduate level our offerings include the following courses: Surveying; Farm Shop; Advanced Farm Shop; Elements of Heating and Refrigeration; Drainage, Irrigation, and Erosion Control; Soil and Water Technology; Food Plant Engineering; Farm Power and Machinery; Farm Buildings and Equipment; and Farm Electrification. At the graduate level we offer a course in Agricultural Engineering Application followed by a course in Advanced Engineering Applications. Our Agricultural Education Department has requested us to offer four additional graduate courses—one in each of the technological fields of Agricultural Engineering. We believe that it is our responsibility to offer courses such as these—courses with sufficient coverage to enable the student to select those which will best serve his field of interest and work.

If such courses are to be meaningful and meet the needs of those we serve they must be continuously revised to keep abreast of technologic changes and the findings of research. In our case we do this through field studies and consultation with farmers, vocational agriculture teachers, teacher-trainers, district supervisors, and our own Division Staff of teachers, research workers, and extension engineers.

Dr. R. R. Harris has charge of our Agricultural Education Relations Section. In addition to teaching certain of our undergraduate and graduate service courses he is responsible for liaison between our department, the department of Agricultural Education, and the office of the State Supervisor of Agricultural Education. He works closely with the District Supervisors

and, except for specific information, he channels all educational material which he prepares or which he feels will be of immediate interest and value to the vocational agriculture teachers through the Teacher-Training Department and the District Supervisors. We believe that such procedure is not only desirable but is essential to harmonious and effective working relations.

A specific example of how we develop and evaluate our programs, at both the college and secondary levels, to meet the needs of teachers of vocational agriculture and those they serve can be illustrated by Dr. Harris' procedure for our Farm Mechanics Program. Briefly, in cooperation with the Teacher Training Department, State Office of Education, School Superintendents, Principals, and Vo-Ag Teachers, he made a study of some 400 representative farms located in the four vocational supervisory districts. The purpose of this survey was to determine the Farm Shop abilities needed by farmers. Both young and adult farmers were interviewed. From this study Dr. Harris was able to determine the farmers' judgment on the priority need or value of the selected list (138 items) of shop abilities. He then submitted this same list to 271 vocational agriculture teachers and to some 35 members of our engineering staff with the request that they predict the value of these abilities for the foreseeable future. He then analyzed the data secured from these three sources and developed a priority list for the abilities based on the composite thinking of the three groups. With background information such as this, meaningful and needed farm mechanic programs can be developed at all levels of instruction. We propose to follow this same general procedure in further developing the educational programs in the other engineering areas for which we are responsible.

In addition to providing pre-service training for teachers of vocational agriculture we feel that it is our responsibility to provide in-service clinics and work shops. This type of training has become increasingly important

¹Paper presented at the Annual Meeting of the Southern Association for Agricultural Engineering and Vocational Agriculture at Mobile, Alabama, April, 1961.

²Alumni Foundation Distinguished Professor and Chairman, Division of Agricultural Engineering, University of Georgia, Athens.

due to the greater complexity of engineering applications to agriculture, insufficient time during the pre-service training period for an adequate background of applied engineering training, and the need for the dissemination of new information developed by research.

Requests for these in-service clinics come to us from the Teacher-Training Department in Agricultural Education. They, not us, decide what area is to be covered. Following the request, Dr. Harris, our subject matter specialist in the area involved, the Teacher-Training Staff, area teachers, selected Vo-Ag teachers, and one or more representatives from the State Department of Education staff, jointly develop the broad program for the clinic. Final details for the conduct of the clinic or work shop are then developed by our staff in cooperation with a representative from the Teacher-Training staff.

In-service work clinics, due to intensity of instruction, must be carefully planned and faithfully executed if they are to be effective. In an effort to meet these requirements, we have developed and adhere to the following procedures:

1. In-service training clinics may be held either on or off the campus.
2. The instructors should make field visits to become better informed as to the needs and the facilities of workers to be served.
3. The clinic should be of sufficient length to accomplish the desired objective.
4. Teaching techniques should conform to those used by the agricultural worker.
5. Equipment and teaching aids used for in-service training should be made available for the worker's future use.
6. Class sections should be limited in size to facilitate intensive instruction.
7. Programs should be planned and scheduled well in advance of the meeting.
8. Studies should be conducted to determine needs in order that the in-service training clinic will be of greatest immediate value to the worker.
9. The clinic should be developed and conducted cooperatively with those responsible for the workers concerned.

The extent of the service we have

Table 1. In-Service Training Clinics (1950-1960)

Number	Subject	Attendance	Conferee Days
24	Farm and Home Wiring	652	1632
1	Farm Water Systems	10	40
18	Tractor Rep. & Maintenance	280	700
3	Food Processing Plants	30	90
1	Color Conditioning	10	10
145	Use & Maint. of Tools & Equip.	1530	1530
3	Farm Fencing	147	294
1	Heating & Refrigeration	30	60
196		2689	4354

rendered the past ten years through this educational medium is shown in Table I.

In those instances where clinics are offered for area teachers only, they, in turn hold follow-up clinics for the Vo-Ag teachers so our efforts are greatly multiplied.

Other activities which we regard as a part of our responsibility include (1) the preparation of technical agricultural engineering materials and teaching aids for use by teachers of vocational agriculture (some 20 film strips and innumerable information sheets), (2) continuous research in technology to design and develop devices, procedures and techniques used to facilitate instructional programs involving farm mechanics in agricultural education, and to make such material available to Vo-Ag teachers, and (3) consultations and conferences with individual teachers on equipment, shop plan and layout, programs of instruction, and engineering advice on special problems. An example of this latter item—during the month of February, Dr. Harris at the request of and accompanied by the Head of the Agricultural Education Department visited four vo-ag departments in the State to assist the teachers in shop layout and equipment selection.

Finally, but of equal importance, is our responsibility to the Southern Association for Agricultural Engineering and Vocational Agriculture of which, as you know, Mr. Henderson is coordinator. As an active participating State in this Association we render assistance when called upon to the fullest extent of our time and facilities. This assistance includes consultation, reviewing manuscripts for publications, and in many instances test teaching the manuscript material prior to publication either at the college level or, when possible, at the field or secondary level. Such participation, on our part, is invaluable to us and,

we hope, of value to the Coordinator and the Association.

Dr. E. T. York, Jr., Director of the Alabama Extension Service, in a paper he presented at the Annual Federal Extension Service Conference held in Washington, D. C., January 10, 1961, had this to say about the responsibility of the Extension Service in getting its job done.

"There are tremendous resources available to us in carrying out these responsibilities, if we will make use of them. If we are to merit our leadership role, we must make a more determined effort to secure the aid of all agencies, groups, or individuals, who can contribute to our efforts. In working with and through other groups, we do two things: (1) we help these other groups more effectively carry out their specific responsibilities and (2) they, in turn, help us accomplish our mission. The net effect is to enable both of us to do a better job and more effectively serve the people to whom we are responsible."

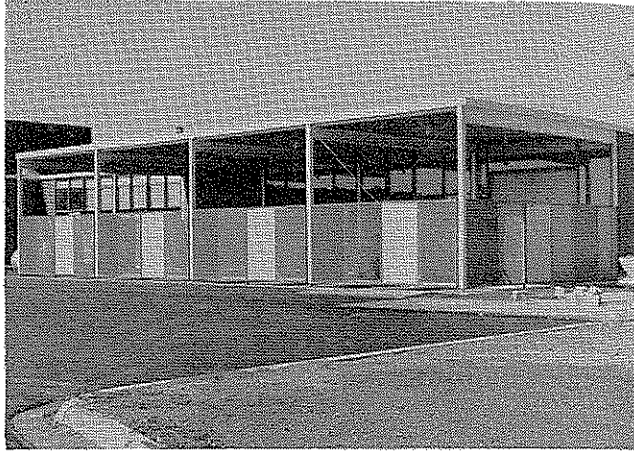
So it is with Agricultural Engineering. Our effectiveness in helping solve the engineering problems of agriculture hinges upon our willingness to accept our responsibilities and our willingness to cooperate with others in carrying out our educational programs.

As far as we, in Georgia, are concerned, we regard it as a privilege to be able to work creatively and cooperatively in helping our colleagues in Vocational Agriculture take the next step in their field just as they, in turn, help us take the next step in our field. We always have and always will accept the responsibilities inherent in every opportunity available to us to further serve the needs of the people of our State and Nation.

□

"Operation Concrete"

CLAYTON R. OLSEN and RAY HUSEN, Vo-Ag Instructors,
Detroit Lakes, Minnesota



Roofed canopy, 26' x 64', before installation of blocks and windows. In this picture, students have already installed concrete floor and approach. This canopy attaches directly on to the inside agriculture shop.

When we moved into our new community high school two years ago, we found that our ag shop facilities would soon be inadequate. The ag shop was 32 x 52 feet, providing about 1700 square feet, including a 10' x 10' supply room. Attached to the ag shop, however, was a roofed metal canopy, with an 8 foot cyclone fence surrounding the enclosure, which measured 26' x 64' (1650 square feet). This area was meant as a storage area to hold machinery, lumber and also act as an outside work area during fall and spring. This area, however, though much better than nothing, was far from satisfactory as blowing dust, rain and snow filtered

into all parts of the roofed enclosure. The area, however, had great potential. It was quite apparent, that with the building program the school district had already incurred, the administration was understandably not eager to enclose the canopy area. We, as ag instructors, realized the benefits that would accrue from enclosing the area. Furthermore, we desperately needed it. We had attended the Concrete Workshop for Ag Instructors, sponsored by the Portland Cement Company and our local cement dealer, Mr. Pete Neitzke. We felt that we had the "know-how" to do the job, and if the school district would pay for materials we would do the rest. It would provide excellent, practical, instructional material for "learning by doing" for our vo-ag classes. At first, we believe our superintendent was a bit hesitant whether we could do the job. But once we had the green light, we drew up plans and started at once. Spring was just around the corner and time was "a-wasting."

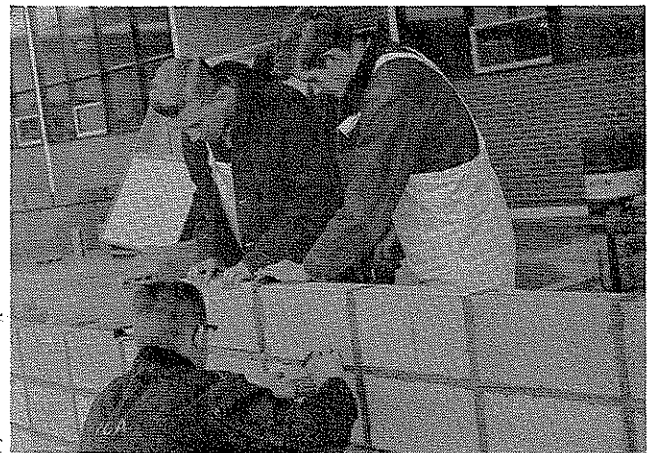
First, we had to move out considerable sand and gravel to obtain the right grade for the concrete floor. We did this by using a tractor and slip shovel. Forms were made of 2" x 6" x 12' material. Slabs of concrete, approximately 10' x 10', were laid in alternate spaces between the ag shop wall and the foundation footing of the canopy. We used an electric concrete mixer, hauled in washed aggregate, and mixed our own concrete. We also used expansion joints and reinforcing mesh in the concrete. The laying of the floor was done in approximately three weeks and turned out in excellent shape. The average thickness was 5-6 inches.

The next fall, work was begun in earnest to build up the walls. We used a 4" x 8" x 16" lightweight block which was laid up to fit inside the flanges of the I-beam supports which were 16 feet apart. We also used brick ties every second course, which would be used to hold a brick facing to the block. Different patterns were laid up by the students, namely running bond, stack bond, and basket weave. Actually a 4" block is harder to lay than an 8" block because it is more tippy. If students didn't lay the blocks up plumb and full to the string, we told them to pull them out and lay them up right. The workmanship performed by the students was amazing; they are capable of doing a top-notch job. Some were more adept than others, but no major problems were encountered. The 4" x 5" I-beams located on 16 foot centers, served as excellent story-poles. Within these wall sections, different patterns of block were laid up.

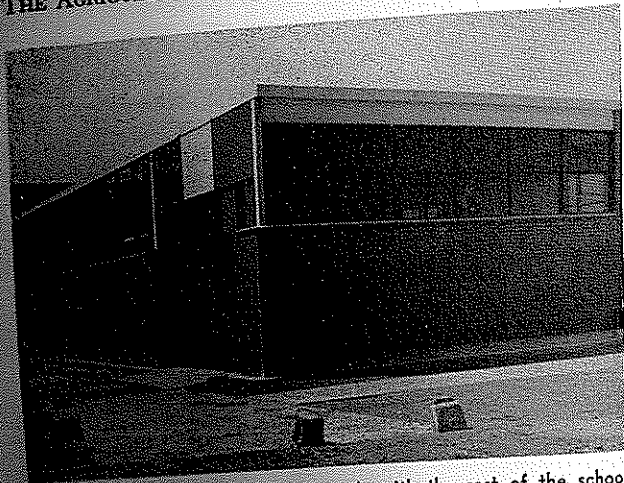
Eleven courses of block were laid,



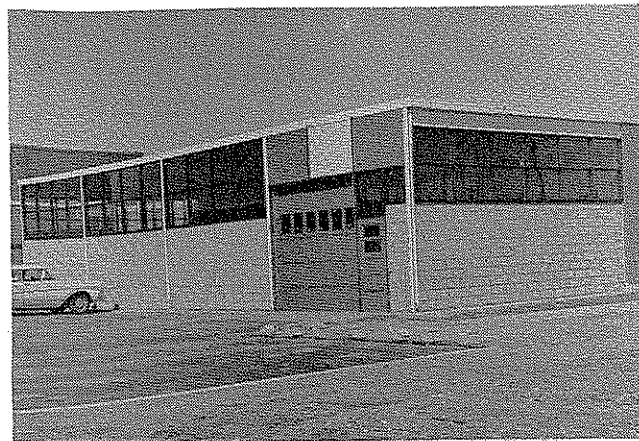
This student is laying up a tricky basket weave pattern. He is the son of Mr. and Mrs. Ed J. Chadbourne.



These students are laying up a horizontal stack bond. From left to right are: (in crouched position) Gordon Johnson, Billie Hill, and Kelly Nasset. Blocks laid in this pattern result in continuous vertical and horizontal joints.



The completed structure ties in neatly with the rest of the school plant.



Blocks and windows have been installed. Brick ties can be seen protruding from the blocks. These will hold the brick facing to match rest of school building.

anchor bolts installed and a plate anchored to the top course. The window design had to architecturally match the rest of the windows in the school. We used 2" x 6" redwood for frames and anchored these to 3/8" bolts which were welded to the I-beam supports. Frames were rabbeted for double-strength glass and were also treated with creosote preservative. After this, frames were caulked and strips were nailed against the glass to hold them in place. Average size of each glass pane was 4' x 4'. Eleven courses of block reached a height of 7'-4". Above this then, was approximately 8 feet of glass area, which faced primarily to the south, but also to the east and west. We also

framed an opening for a 10' x 10' overhead shop door, and installed a 5 section, 6 light door. A 2'-6" service door was also placed next to the overhead door.

It was felt that the brick facing on the building should be done by brick layers as the building must conform and fit in with the rest of the school plant. Other than this brick facing, the students did the entire work of enclosing the structure.

Within the canopy we built a double deck storage area in one end of the building. Part of this is also used as a project storage area. We also installed a 2 ton U. S. Army surplus hoist on one of the 12" I-beams in the ceiling. In this enclosed

canopy, we have our lumber and metal storage and use the space for building larger projects and repairing machinery. Part of the space is also used for the driver's training car.

The students felt very proud in having a hand in the construction of this building project. They not only learned some mechanics skills but constructed a building that has proved to be very functional. On the coldest nights, the temperature will drop to about 15° above zero; however, the temperature rises quickly during the day, due to the solar energy and the large glass area. This structure has proved to be a tremendous asset—we don't know what we would do without it. □

Shop Discipline

W. FORREST BEAR, Instructor, Agricultural Engineering Department, Iowa State University, Ames



- S—Supervisors
- H—Have
- O—Old
- P—Problems
- D—Determination
- I—Interesting Teacher
- S—Space
- C—Complete Set of Tools
- I—Interested Students
- P—Projects
- L—Learning Situation
- I—Integrated Program
- N—Neatness
- E—Effective Methods

When supervisors and superintendents are discussing their problems, shop discipline receives its "fair share" of the time. The cause and solution of the problem has resulted in many trying moments and in some cases an unemployed teacher. Causes of discipline problems have already been determined by many individuals and include:

1. Poor teaching
2. Inadequate facilities
3. Weak school systems
4. The "modern youth"

Supervisors and teachers should stop pointing their fingers at each other and take time to analyze the individual situation. Shop discipline problems generally are attributed to more than one factor. Take the word "Discipline"—let's search for an answer to the problem within its ten letters.

"D"

Some individuals have the natural ability needed to be a successful shop teacher. A greater percentage of the teachers lack this ability and a few

will never achieve satisfaction in this area. There are a large number of teachers who can improve their shop program with added DETERMINATION.

Is it unforgivable if the beginning teacher has problems? Many think not, but if the teacher continues to have the same problem for several years and does not try to correct these faults—this is serious.

Teachers frequently test the students and offer criticism. How often does the teacher take time out to evaluate his own teaching program? Evaluate your teaching methods frequently. Don't be afraid to change the old approach, problems and projects. Realizing the problem, self analysis and desire to improve takes the determination which could promote a better shop program.

"I"

Be an INTERESTING TEACHER. You are a teacher by choice and each person should accept the challenge of excelling in his chosen field of endeavor. Teacher interest should be all inclusive. Be interested in the boy, his supervised farming program and his determined goals. The student will know if you are interested in his behalf and will generally reward the teacher with better cooperation and conduct. The student will have many problems. Some of the problem areas may not be of prime interest to you, but the problem and answer may be very vital to the student. His problem is your problem and the teacher must often provide the interest and motivation to give the student his initial momentum. Interest is contagious—Be a carrier of the affliction.

"S"

"I need more SPACE for the shop program." Crowded shops are often blamed for discipline problems. This could very well be a factor promoting a shop discipline problem. On the other hand let's triple the shop size and sprinkle the same few projects around the added area. Does this appear to be a wise use of the taxpayer's dollars? The good shop teacher has a shop full of projects whether he is operating in a garage or a gymnasium. I am not advocating small shops, only stressing that space alone is not the determining factor when searching for the answer to discipline problems.

"C"

A COMPLETE SET OF TOOLS

is essential for a successful shop program. Students waiting to use the welder, drill press, table saw or electric drill are often confronted with "what to do" as they wait. Shop teachers should work with the student and develop the logical construction procedure, but regardless of the amount of planning there will be waiting if sufficient tools are not available. There is a trend to reduce the length of the class period. Shorter class periods automatically increase the need for more tools in order to be more efficient. When listing the shop tool needs think of 1962 not 1926. Students use electric drills, electric hand saws, electric sabre saws and impact tools at home. Don't consider only the brace and bit, hand saws, coping saws and the monkey wrenches in the modern shop. Tool companies generally allow a liberal educational discount, therefore, provide a sufficient number of tools to have an efficient shop.

"I"

An interesting teacher can more easily surround himself with INTERESTED STUDENTS. A high percentage of boys are interested in shop work.

Students enrolling in a class because of personal preference have initial interest on which to build a successful program. Problems automatically arise when all students are forced to take a specified course. Students must take history and English, for example, but it's a different situation when a student is confined to a desk or chair than when he is released in a shop area. Enrolling all students in shop makes as much sense as requiring all students to participate in the concert band or the varsity football team.

The boy whose main interest is metal working will also be interested in rafter layout when he realizes the relationship between rafter and brace layout.

Machinery selection, service and maintenance is more meaningful if the student is working with problems from his home farm.

Salesmanship is not confined solely to the business counter. Teachers are salesmen and interest in the course and subject matter is the merchandise. The learning process is promoted by interest.

"P"

The amount of emphasis that should

be placed on developing specific shop abilities and the amount on construction of complete units in shop is often discussed. PROJECTS are a must in a shop program and too frequently good projects are not plentiful.

One teacher will have skilled welders in the production of lap welds, butt welds and corner welds. A student must have these basic fabrication abilities.

Another teacher stresses only construction of personal projects in order to fill the shop space. Organization of a teaching program around problems which arise during project construction is difficult and often inadequate. Quality construction is often sacrificed in order to complete the project or to keep the shop filled to capacity.

Project construction does provide an opportunity to apply previously learned abilities in addition to new skills and judgments. The answer is a balanced program between teaching only shop abilities and teaching only project construction. The actual division of time is difficult and the solution must be determined for each teaching situation. Develop a complete farm mechanics teaching program. Let the program reflect thoughtful organization, not a haphazard birth and growth.

"L"

Construction of a portable self feeder for livestock provides an opportunity to teach several shop abilities. A few of these abilities would be:

1. Selection of building materials
2. Construction procedures
3. Use of the electric hand saw
4. Squaring a building
5. Rafter and brace layout
6. Application of a wood adhesive
7. Roofing application
8. Painting

This project has provided a LEARNING SITUATION. If the project belongs to the boy there will be more interest, thus promoting a better teaching situation.

Construction of 10 self-feeders would provide ten times as many teaching situations—unless the teacher unitized the construction and one work crew performed the same job ten times in order to achieve greater efficiency.

Too many shop teachers assume the students know how to use a specific shop tool or how to perform a certain construction job. A thirty second demonstration at the right time on

correct nail clinching could be more effective than a 30 minute presentation under artificial conditions.

A shop ability that has become quite simple to the upper classmen may be a complete mystery to the lower classmen. New students arrive each year. They too will need the benefit of that demonstration performed only a short time ago.

"I"

The value of an INTEGRATED PROGRAM is tremendous. The freshman student with a sow and litter project may need a hog house, or feeder now—not two years from now when shop is normally taught. Construction and maintenance work is an essential part of the boys' supervised farming program. It is related to production of crops, livestock and their processing and storage. Farm management decisions often involve buying or repairing of machinery, remodeling buildings, and modernizing the materials handling equipment on the farm.

Methods of reducing the cost of production will be as important in the future as methods of increasing production.

Construction and maintenance will help "cut corners," reduce overhead

and the expense cost per unit produced.

Don't divorce the shop work from the over-all program; there are many ties which will promote interest and provide an excellent teaching situation.

"N"

There is one relatively easy way to destroy an ideal teaching situation and create shop discipline problems. Be an untidy housekeeper, and fail to provide storage facilities for tools, supplies and projects. The key word is NEATNESS. Generally the tools will not be thrown on the floor or left on bench tops if storage facilities are available. Provide an organized clean-up detail. The majority of the students will take pride in a neat, orderly and well-organized shop. For students who lack pride in personal and public property there is a lesson yet to be taught.

An excellent way for the teacher to teach these sterling qualities is to practice them himself by providing the ideal example.

"Do as I do—not, Do as I say"

"E"

Are these EFFECTIVE METH-

ODS for reducing shop discipline problems? One point may help you and another point someone else. Shop discipline problems may be caused by one specific factor but generally are the result of several factors.

How is DISCIPLINE related to our original four causes of shop discipline?

Poor Teaching results in discipline problems. If the arrow points your way it's time to evaluate, analyze and reorganize.

Inadequate Facilities promote discipline problems. If this is the case develop a strong shop program and provide a need for a bigger shop, more tools and better equipment.

Weak School Systems encourage discipline problems. You are pointing the finger at yourself. Improve your program and set a good example for others.

The Modern Youth is the cause of discipline problems. Look in the mirror. Recall your youth. Be honest with yourself and strive to make the world a better place in which to live using the raw materials present—maybe the ingredients are better today than in the good old days. □

Practical Farm Mechanics

LEON J. ALGER, Consultant, Vocational Education Research, Department of Public Instruction, Lansing, Michigan, and
WILLIAM E. DRAKE, Teacher Education, Cornell University, Ithaca, N. Y.¹

We would not expect an architect to be able to adequately design a skyscraper without first having acquired a great number of basic skills. Likewise, we should not expect a farmer to be able to construct a hog house or a wagon without first having mastered a large number of basic skills.

There are at least two schools of thought as far as teaching farm mechanic skills are concerned. One school advocates the use of project work in teaching skills. The idea being that students should master skills as they have a need for them. The other school of thought suggests that students should develop ability in doing skills before they need to perform

the skills. In practice the latter method seems to be more practical for the writers. It has been the experience of the writers that developing ability in farm mechanic skills stimulates the desire in students to do project work. It is much more difficult to get students to undertake good comprehensive projects unless they feel confident as to their ability to perform the skills needed to complete the project. Once students have developed skill and feel confident as to their own ability, they (and their parents) will be more inclined to undertake comprehensive project work. Therefore, it would seem that we will have to plan a course of instruction that will insure acquiring the basic skills of farm mechanics.

In order to accomplish this, the course of study should be planned with the students at the beginning of

the freshman year and at the beginning of each of the other three years. This teacher-student planning should include farm mechanics. At this time the writers attempt to guide students to select areas in farm mechanics necessary for proficiency in farming. This planning must start with the home farm in order to be effective. Planning in farm mechanics should start with a look at the enterprises on the home farm and those in the boy's own farming programs. From there the discussion should bring out the kinds of farm mechanic jobs that will need to be done. After the various jobs have been determined, the skills, abilities, and understandings needed can be readily selected. It is important that the students be deeply involved in this kind of planning. After the various units and the skills and abilities to be taught have been

¹Both the authors were formerly supervising teachers at Williamston, Michigan, at the time the article was written.

Figure 1. Sample Farm Mechanics Course Outline—Agriculture II

Student's Name	Date and Assignment by Weeks															
	Oct. 6	Oct. 13	Oct. 20	Oct. 27	Dec. 8	Dec. 15	Dec. 22	Dec. 29	Feb. 2	Feb. 9	Feb. 16	Feb. 23	Apr. 27	May 4	May 11	May 18
1.	A	A	A	O	O	O	C	C	T	T	T	S	S	M	M	M
2.	A	A	A	O	O	O	C	C	T	T	T	S	S	M	M	M
3.	A	A	A	O	O	O	C	C	T	T	T	S	S	M	M	M
4.	A	A	A	O	O	O	C	C	T	T	T	S	S	M	M	M
5.	O	O	O	A	A	A	S	S	T	T	T	C	C	M	M	M
6.	O	O	O	A	A	A	S	S	T	T	T	C	C	M	M	M
7.	O	O	O	A	A	A	S	S	T	T	T	C	C	M	M	M

Code

S—Sheet Metal
T—Tractors
M—Machinery

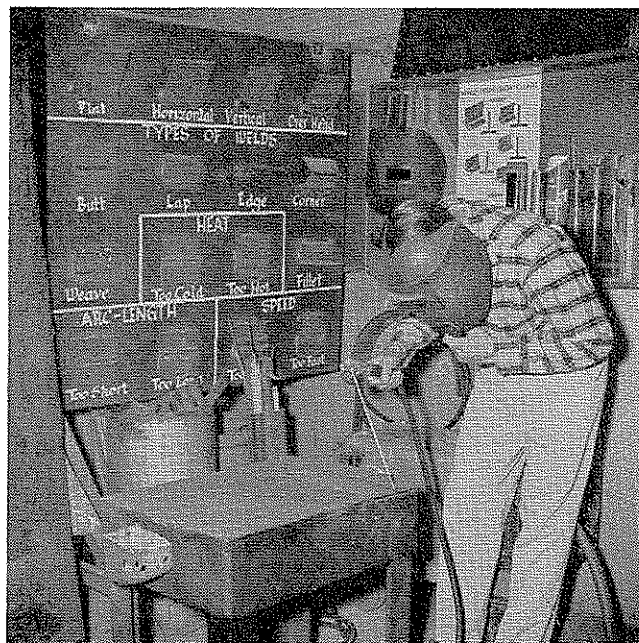
A—Arc Welding
O—Oxyacetylene Welding
C—Cold Metal

selected, a time schedule is set up. (See Fig. 1) This time schedule is flexible enough to allow adequate time for individual project work. Each student has an assignment for the entire time the class spends in the farm shop. However, the assigned work will involve but a fraction of his time and he is expected to have projects to work on during the balance of his time.

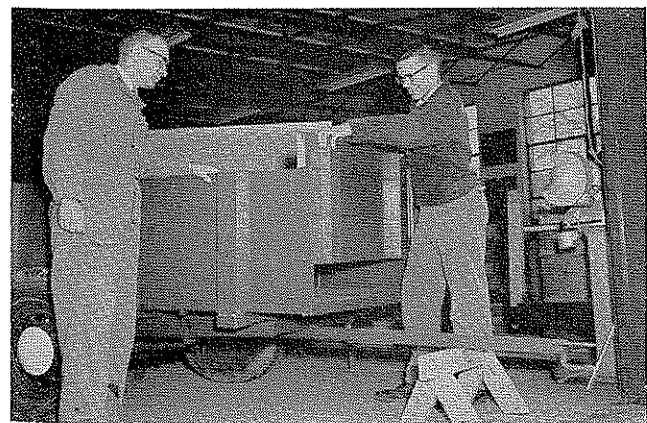
In order to be sure that all students acquire the necessary skills, a series of question sheets and job exercises have been devised by the writers. Job exercises are assigned for each major area of instruction. Jobs should be simple involving the necessary skills and abilities. It is important that these jobs should be of a practical and useful nature insofar as possible. Small items that involve the necessary

skills and are useful around the farm should be selected. Examples might be sharpening certain tools, solder-

ing exercise, making a U-bolt, making various types of welds, etc. These exercises provide for the systematic development of the skills in each area of instruction. Job sheets for each one of the exercises are provided the student. Demonstrations of the skills involved are given to the students. Students may substitute desirable projects for the job portion of these exercises. Along with the exercise, students are required to answer a series of questions relative to the skills, abilities, and understandings necessary to successfully do the job. These questions must be completed and handed in to the instructor before starting the job exercise. Both the



Practice Here Leads To . . .



. . . Practical Application Here.

questions and the exercise are graded.

A schedule is set up providing for a rotation of the instructional units to be taught in any one year. The class is divided into three or four easily managed groups for the purpose of demonstrations and use of tools and equipment. The writers feel that it is important to provide adequate time for project work when this system of instruction is used.

It should be noted that the skills taught must reflect the things that

the student will need to know in order to adequately do the projects and jobs he has to do on his own farm. It is essential that these real needs be ascertained during teacher-student planning both on the farm and in the classroom.

Summary

If students are to develop an adequate number of farm mechanic skills it is necessary that systematic in-

struction in these skills be given. This can be done by using a series of job exercises and questions, plus allowing time for individual project work. If this system of developing needed skills before a student undertakes difficult projects (often involving considerable investment) is used, students and parents are more confident of undertaking project work. In other words, this system stimulates students to do more comprehensive farm mechanic work. □

◀ **TIPS THAT WORK** ▶

A Library Book Drop

By DORIS REDDICK and HENRIETTA SIMEONE, Librarians, North Syracuse High School, New York

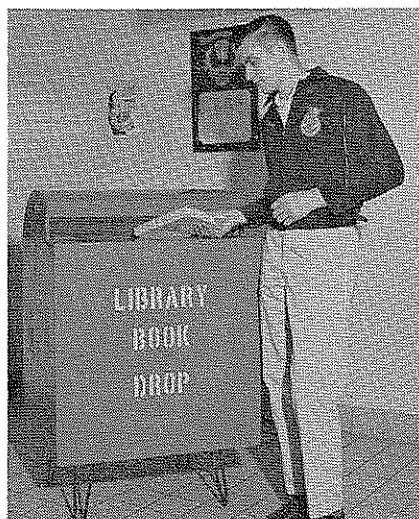
What librarian does not have problems with overdues? The librarians at North Syracuse High School did have this situation and with the aid of the Future Farmers of America and their teacher, this situation has been partially alleviated.

Our Senior High School library is located on the third floor. Yes, it was too far for high school students to walk to return books. Different gimmicks were tried but the most successful one, by far, was a postal-type box located in the main corridor of the school. It is directly in front of the main doors where most of the buses are unloaded.

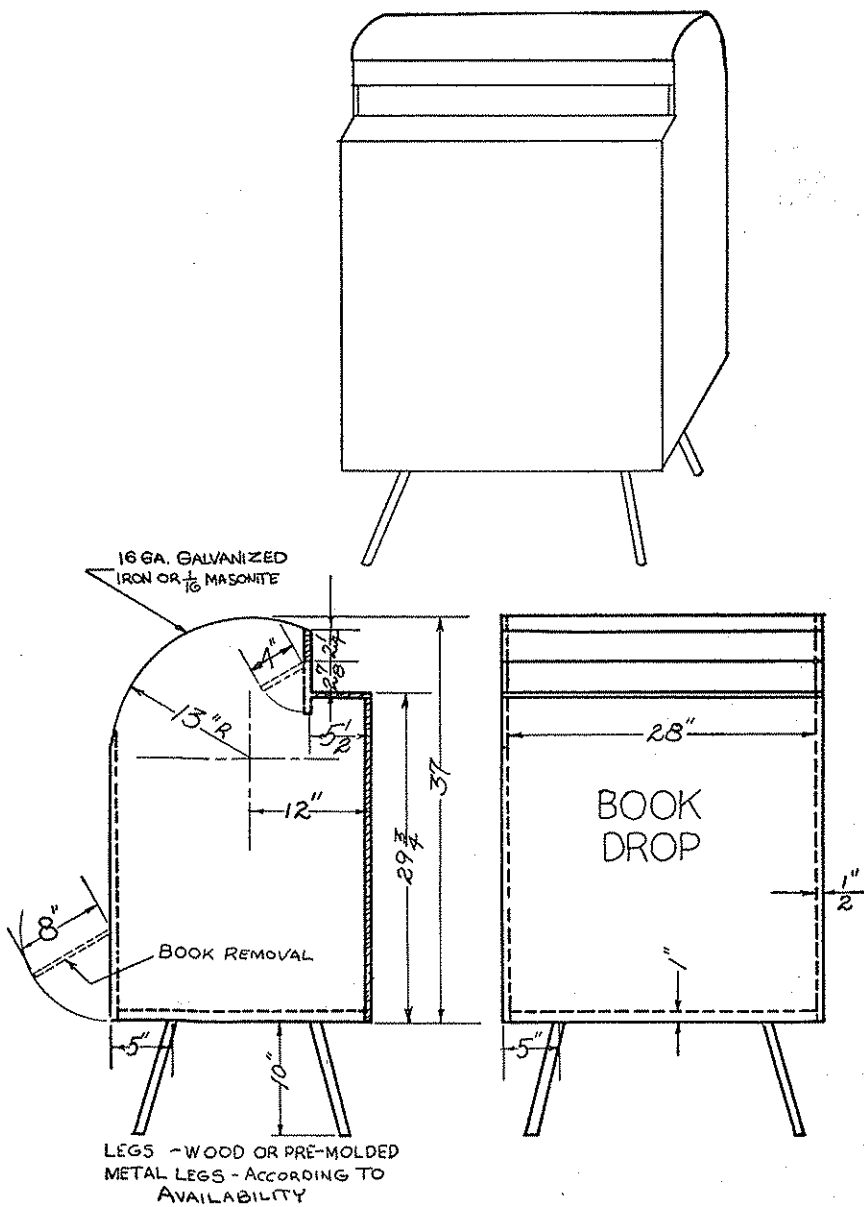
The price of a metal postal box made the idea practically prohibitive. With the cooperation of the teacher of vocational agriculture, Mr. Donald Watson, who drew up the attached plans, and with some of his students

who built the box, we now have this wooden book drop, attractively painted in blue and white, our school colors.

(Continued on page 166)



Book drop.



LEGS - WOOD OR PRE-MOLDED METAL LEGS - ACCORDING TO AVAILABILITY

BOOK DROP SCALE 3/8"=1"

News and Views of the Profession

Dean Fitzgerald Retires

An educator received his "Book of Letters" last night, but found them to be of an honorary rather than academic nature.

N. E. Fitzgerald, dean of the University of Tennessee's College of Education, was honored guest at a "farewell banquet" at the University Center on the eve of his retirement. Friends and former students planned



Dean Fitzgerald receiving his "Book of Letters." Left to right, Dr. George W. Wieggers, Jr., Head of the Agricultural Education Department, University of Tennessee, Dr. Andrew D. Holt, President, University of Tennessee, Dean Fitzgerald, and Mr. Elmo Johnson, School Principal, Knox County, Tennessee, who was Master of Ceremonies.

the surprise affair for the widely known educator to relive memories and highlights of his 42 years of service to U-T and the southeast area.

The unusual "Book of Letters" presented Dean Fitzgerald at the banquet was a bound volume of over 100 letters from his friends and from former students. The letters make up near-history of the dean's contribution to agriculture and education in this area throughout the years, many noting how his influence and guidance affected careers, others recalling humorous incidents from the past. An additional gift presented during the program was on a cash basis, made up of contributions from throughout the southeast.

Friends of long-standing presided at the banquet in Dean Fitzgerald's honor. J. W. Brimm, U-T College of Agriculture development specialist, welcomed the more than 90 persons attending the program.

Dr. G. W. Wieggers Jr., head of agricultural education, and Dr. E. M. Ramer, head of the curriculum and

instruction departments joined in presenting a history of Dean Fitzgerald's long service at the University. Elmo Johnson, former Knoxville insurance executive, an outstanding student and now school principal, Knox County, served as master of ceremonies for the event.

Dean Fitzgerald left Texas A. and M. College in 1919 to take charge of the U-T Department of Agricultural Education, which was created that year. He served as head of that department for 24 years before becoming Dean of the College of Education in 1943.

Under his leadership the College of Education has experienced tremendous growth. Reorganized in 1943 to bring together practically all U-T teacher-training units, the College of Education recorded 260 undergraduate students and a

handful on the graduate level. This year the college enrollment was 2,019 undergraduate students and 1,125 studying on the graduate level.

From the 61 B.S. in Education and five M.S. in Education degrees awarded in 1943-44, Dean Fitzgerald saw the number of diplomas conferred in his college rise steadily to the 200 B.S. degrees, 113 masters, and 16 Ed. D. degrees awarded in 1960-61. When Mr. Fitzgerald became dean in 1943, the College of Education was made up of six departments, with 17 full-time staff members. Today the college has grown to 10 departments and 44 regular staff members.

A native of Gerald, Missouri, Dean Fitzgerald received the B.S. in Education and the B.S. in Agriculture from the University of Missouri, and the M.S. in Rural Education from Cornell. He attended Columbia University and Ohio State University for other graduate work.

He has been accorded many honors for his long service to education in

general and to agricultural education in particular. One of his most recent honors came last April when the Southern Regional Conference of State Supervisors and Teacher Trainers in Agricultural Education, meeting in Mobile, Ala., presented him its "Distinguished Service Citation." This citation is given only to educators who serve the field of agricultural education with distinction for a minimum of 29 years.

Dean Fitzgerald, who lives at 8 Hillvale Circle, Knoxville, has professed a desire to just "take it easy" after his retirement Sept. 1. But his friends honoring him at the banquet last night indicated that they expect his influence and his service to be of a continuing nature on into the future. □

A Library Book Drop . . .

We still have books that are not returned on time, but the numbers have been greatly reduced since we made it more convenient for the students to return the books.

Submitted by:

Donald Watson, Vo-Ag Instructor,
North Syracuse H.S., N.Y.



HEREFORD CATTLE: THE TURNER RANCH, MASTER BREEDERS OF THE HEREFORD LINE by Roy P. Stewart, published by Homestead House, Skirvin Tower, Oklahoma City. 139 pp., illustrated, 1961, price \$3.75.

This is a new book giving an account of a well known Hereford cattle ranch and its contribution to the animal world. It deals with the ranch in three parts; namely, the historical aspects, the development of the herd, and its complex management problem. The book is dedicated to the 20,000 FFA and 4-H Club members in Oklahoma, who in the past twenty-two years have participated in the youth field days conducted on the ranch.

The text provides an educationally inspirational background for young men planning to go into the business of beef cattle breeding, since it relates the experience of several persons whose decisions were made with a great deal of foresight and wisdom. It discusses the breeding history of several animals, whose records did much in later years to set the stage for the production of outstanding show animals and breeding stock. This book contains diagrams and pictures to clarify the location of the ranch and the outstanding animals as a part of the historical record.

Mr. Stewart is the "Country Boy" columnist for the *Daily Oklahoman* and has been a writer about livestock and agriculture for 25 years in his own paper and for regional and national magazines.

B. E. Gingery, Consultant
Agricultural Education
State Department of Education
Lincoln, Nebraska

AGRICULTURAL ENGINEERS' HANDBOOK by C. B. Richey, Editor-in-chief, Paul Jacobson, Subeditor, and Carl W. Hall, Subeditor, published by McGraw-Hill Book Company, Inc., New York, New York, 880 pp., illustrated. 1961. Price \$19.50.

This Agricultural Engineers' Handbook is a comprehensive coverage of the field of agricultural engineering. The author indicates in the Preface that the Handbook is intended to include under one cover the basic theory and practice for the various areas of agricultural engineering, and the application of engineering to the problems of agricultural production. The authors have assumed basic reader familiarity with agricultural engineering subject matter. Elementary information, such as definitions, has been held to a minimum, and the amount of mathematical tables and design information readily available from other books has been minimized.

The book is composed of four sections. Section 1, Crop Production Equipment, deals primarily with tractors and field machines. Section 2, Soil and Water Conservation, deals with such areas as: principles of agricultural hydrology; land leveling and grading; agricultural drainage; wind erosion and its control; terraces and diversions. Much of the material presented in this section is the result of recent research by specialists in the

USDA Soil Conservation Service and Agricultural Research Service and has not heretofore been published. Section 3, Farmstead Structures and Equipment, covers the areas of farm structures, rural electrification, and crop processing. Section 4, Basic Agricultural Data, presents data affecting the solutions of agricultural engineering problems.

This book presents a wealth of material, 57 chapters, compiled by 41 specialists. It is well illustrated with charts, tables, sketches, pictures and other helpful visual aids. The book is written on the level of the college student and should be a valuable source book for people engaged in engineering practice, including teachers of vocational agriculture with strong backgrounds in agricultural engineering.

C. B. Richey is Chief Research Engineer, Tractor and Implement Division, Ford Motor Company; Paul Jacobson is State Conservation Engineer for Iowa, Soil Conservation Service, U. S. Department of Agriculture; Carl W. Hall is Professor of Agricultural Engineering, Michigan State University.

Rufus W. Beamer
Teacher Education
University of Tennessee

SWINE SCIENCE by M. E. Ensminger. Published by the Interstate, Danville, Illinois, 692 pp., 1961. List price \$6.00.

This book is a revision of the second edition which was published in 1957. In this new edition the author has included information about confinement rearing, disease-free hogs, manure conservation, automation, artificial insemination, and integration. In addition to the above topics the author deals extensively with swine feeding, breeding, management and marketing. Every chapter includes pictures or charts and graphs which help the reader grasp the major concepts and comprehend the facts and figures of hog production.

Most of the material in this book would be useful to vocational agriculture students at the high school level. Every department which includes swine in the high school course of study should have one or more copies of *Swine Science*.

Dr. Ensminger is chairman of the Department of Animal Science, Washington State University. He has

written several books in the livestock field including the very popular *Stockman's Handbook*.

Paul Hemp
Teacher Education
University of Illinois

CONSTRUCTION AND MAINTENANCE FOR FARM AND HOME by Edward W. Foss. Published by John Wiley and Sons, Inc., New York, 373 pp., illustrated. 1960. Price \$6.95.

This book on the fundamentals of construction and maintenance is a clear concise guide to shop skills and materials. Information needed before and while engaging in shop activity is given.

The necessary tools, equipment, and materials are discussed with each skill. Considerable related information is included to help acquaint the reader with the "why" and to broaden his knowledge of the field. The book is well illustrated with easily interpreted sketches, drawings, and photographs of various skills, tools, and materials. It is well organized and easy to read. Review or study questions are listed at the end of chapters.

There are 12 chapters with 5 to 18 sub-topics in each. Subject matter includes woodworking, carpentry, masonry construction, painting, metal work, tool maintenance, welding, power transmission, and farm workshops. Machinery, power, electricity, and water supply are not included. This book should be very helpful as both a teacher and a student reference in vocational agriculture.

Mr. Foss is Professor of Agricultural Engineering at Cornell University.

William R. Bingham
Teacher Trainer
University of Kentucky

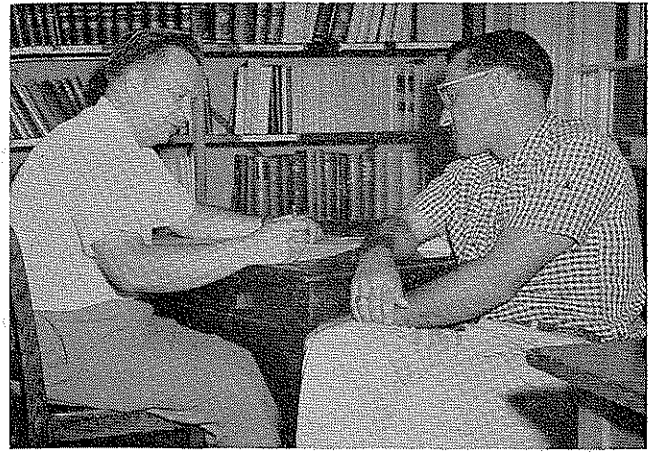
The Cover Picture

A four-day welding workshop for North Dakota vocational agriculture instructors was held at the North Dakota State University of Agriculture and Applied Science August 14-17, 1961. Instruction included demonstrations, discussion, and practice in welding. The workshop was conducted cooperatively by the departments of agricultural education, mechanical engineering and agricultural engineering at NDSU, with representatives of several welding companies assisting.

In the cover picture four of the eighteen instructors enrolled in the workshop are shown observing as John Forrer of the NDSU staff, one of the workshop instructors, shows the proper position of the rod for overhead welding. Left to right are Fred Gerth, New England, Herman Larson, Towner, Don Johnsen, Larimore, Cliff Nygard, Bismarck, and Forrer.



Hon. Thomas D. Bailey, State Superintendent of Public Instruction for Florida, congratulating George Culverhouse, Jr., 1961 Star State Farmer; Mr. and Mrs. Culverhouse, and Ed Raikes, Adviser, Ft. Pierce, Florida, FFA Chapter, at the State FFA Convention in Daytona Beach.



Dr. Walter Bjoraker, left, was guest instructor at Penn State University this past summer, and is shown talking to Mr. W. B. Rose, Young Farmer Instructor at Punxsutawney, Pa. Bjoraker is Professor and Chairman, Department of Agricultural and Extension Education, University of Wisconsin. The picture is representative of the many conferences he held with teachers in summer school.

Stories in Pictures



Workshops on repairing farm machinery were held throughout Kansas for vocational agriculture instructors. Teacher educator Paul Stevenson is shown on right instructing Merwin Stearns (under the machine), Manhattan, and Ronnie King, Glasco.



Herbert Sherman, 19, of Genoa, New York, recipient of the 1961 Regional Future Farmers of America Star State Farmer award, is presented a pure-bred registered Holstein heifer by TV celebrity, Art Linkletter, as Merl Douglas, Eastern Vice President, Sears-Roebuck Foundation, which donated the heifer, and Lyle Carpenter, National FFA President, observe the presentation. The award was made during the Governor's Night Program at the Eastern States Exposition in Springfield, Massachusetts, as governors from six states and an audience of 6,000 applauded.



1961-62 officers of the Minnesota Vocational Agriculture Instructors' Association, Inc., are, left to right, Dewain Englund, Canby, President; Paul M. Day, Faribault, President Elect; Dennis Lehto, Evansville, Vice Pres.; Marvin Thomsen, Pipestone, Secretary; W. O. Woodman, Rochester, Treasurer; and Harry Pierce, Jr., Winona, Membership Secretary. Not pictured: Leo Keskinen, Duluth, Past President.