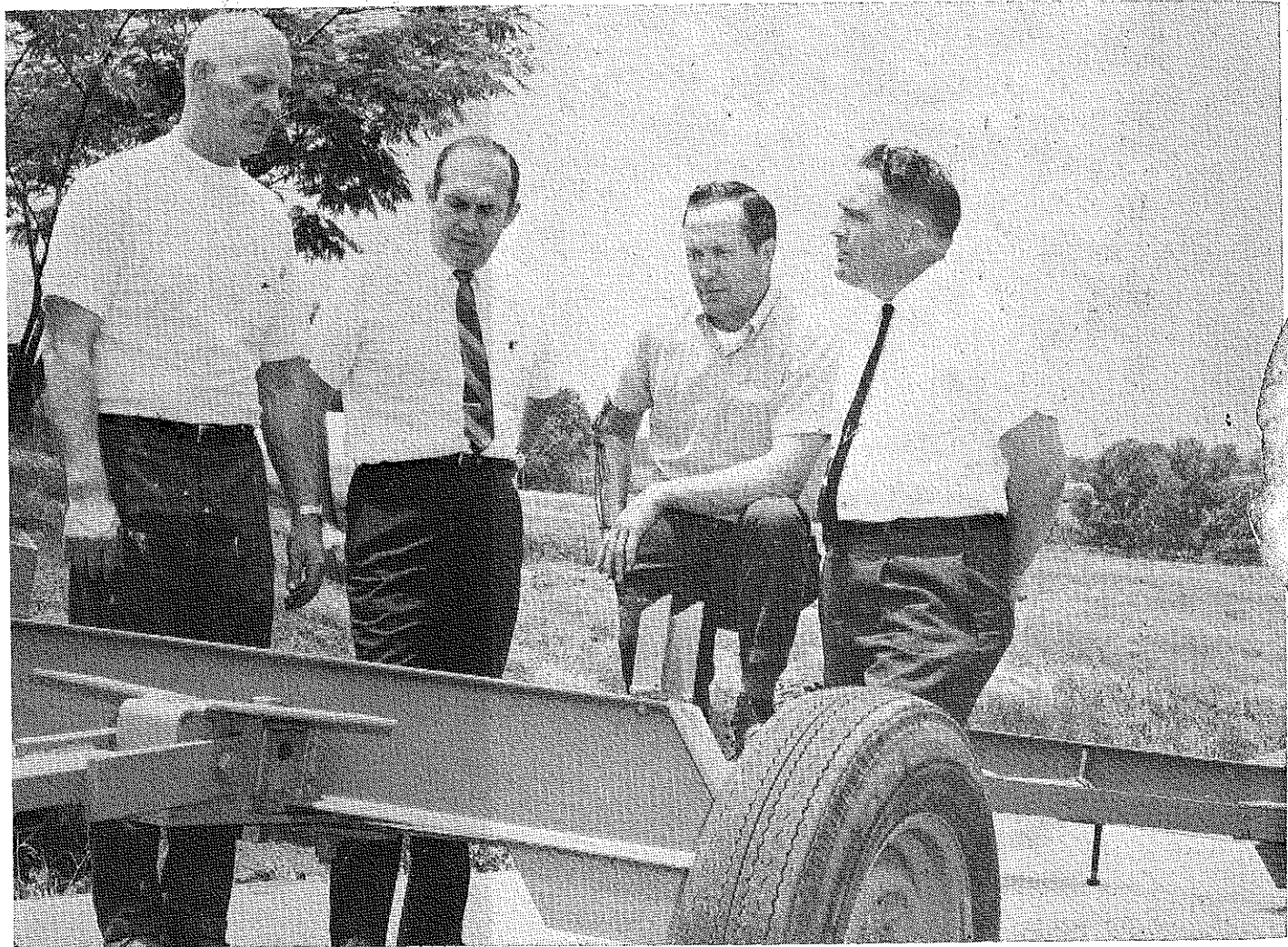


Stories in Pictures

ROBERT W. WALKER
University of Illinois



Since 1953, FFA members in Minnesota have contributed over \$200,000 to physically handicapped campers. The funds have been used to build a speech therapy building and greenhouses on the Camp Courage grounds. (Photo by W. J. Kortsmaki, Minnesota FFA Executive Secretary)



Inservice education in farm equipment construction has been provided teachers of vocational agriculture in upper East Tennessee the past two summers. Discussing a wagon made in the 1969 session are (left to right) Jesse Clonts, Vocational Agriculture Teacher of Troy, Missouri, who taught the course; Henry G. Williams, West Tennessee Supervisor of Vocational Agriculture; Cecil Boring, East Tennessee Supervisor of Vocational Agriculture; and John D. Todd, Assistant Professor of Agricultural Education, University of Tennessee. (Photo by A. B. Foster)



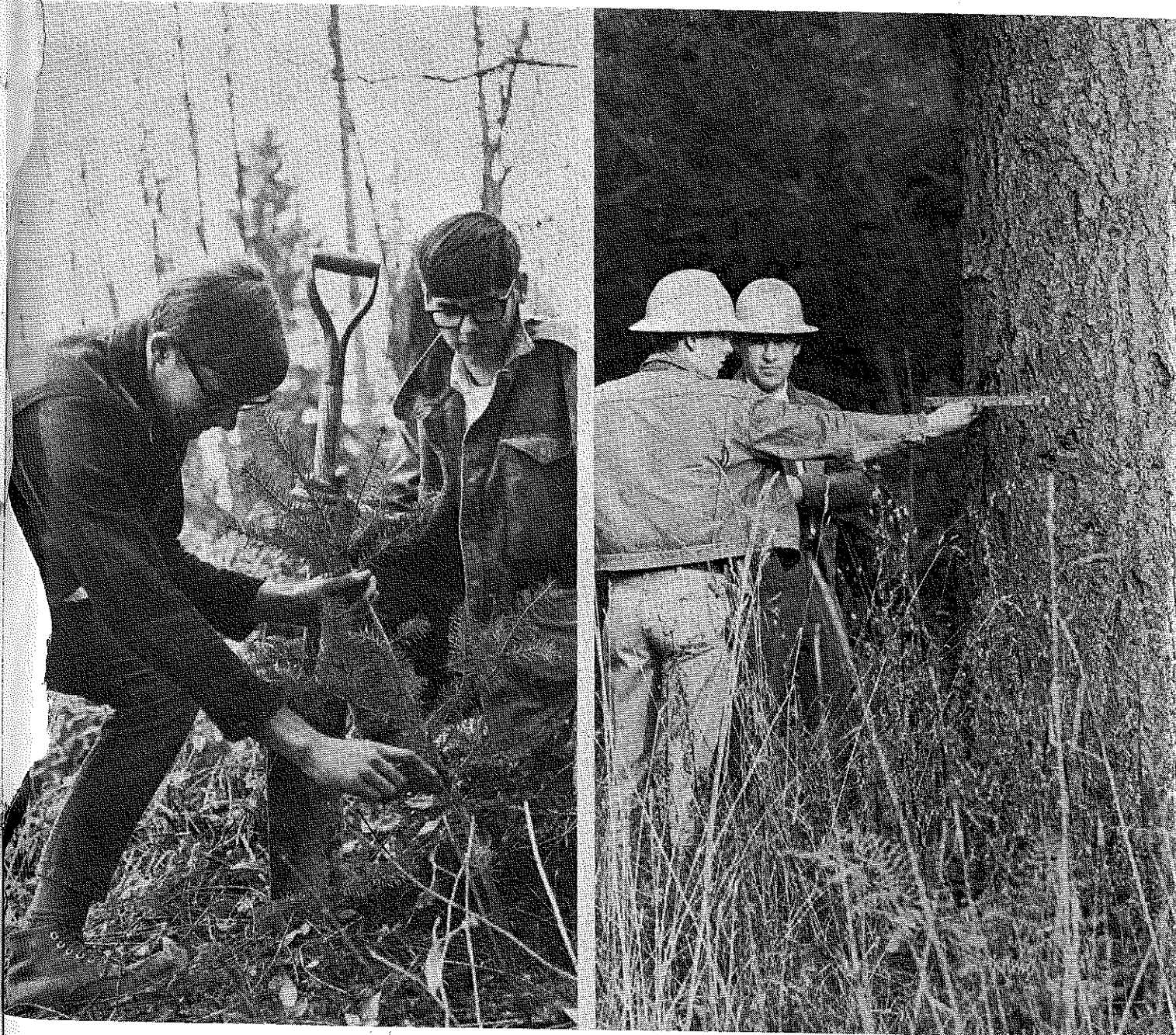
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Agricultural Education

March, 1970

Number 9



Featuring —

INSTRUCTIONAL PROGRAMS IN FORESTRY

THE AGRICULTURAL EDUCATION

MAGAZINE

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Editorials

From the Editor . . .

Is a "New" Vocational Education Emerging?



J. Robert Warmbrod

During the past five years or so a number of prestigious individuals, study groups, and national advisory councils has given careful attention to the role and nature of vocational education in the public schools. Emerging from this scrutiny of vocational education, whether by design or otherwise, there appears to be consensus on some points of view about what some term the "new" vocational education. Perhaps it is the mood of the day, but by implication if not by direct evidence, the contention is evident that all is not well with vocational education or the public school system of which it is a part.

One quickly gets the idea from reading current writings about vocational education that a major point of contention is the relationship between vocational education and general education. The assumption is that there has been and continues to be a schism between general and vocational educa-

tion, particularly in secondary schools. On this point individuals and advisory groups emphasize in their recommendations and pronouncements that vocational and general education are integral parts of a total program of education.

The Advisory Council established by the Vocational Education Act of 1963 declared in its 1968 report that "there is no longer room for any dichotomy between intellectual competence and manipulative skills and, therefore, between academic and vocational education." The National Advisory Council on Vocational Education created by the Vocational Education Amendments of 1968 state in their first annual report that "a separate vocational school or a distinct vocational track should be exceptions, not rules, in a technical and changing society." Professor Rupert Evans of the University of Illinois warns that the numerous advantages of separate, parallel vocational schools may be offset by one tremendous disadvantage, namely, segregation of students by socio-economic level. The National Committee on Secondary Education of the National Association of

(Continued on next page)

Guest Editorial . . .

Forestry: A Challenge To Be Met



Gerald R. Fuller

Forestry seems to appeal to today's action oriented, idealistic youth. Instructional programs in this area should become an important part of vocational education in agriculture, especially in urban areas. Three important ingredients for success are present: employment opportunities, identifiable subject matter, and student interest. We must be sure that appropriate instructional programs are developed.

We should listen to professional foresters. Success of vocational programs in forestry depends to a large degree upon acceptance by the forestry profession. Experience indicates students in our existing "forestry" programs do not possess a clear understanding of employment opportunities and educational requirements for entry into the forestry profession or industry. Many professional

foresters are asking us whether our programs of vocational education in forestry are realistic.

What might be a realistic framework within which instructional programs in forestry should be developed? Evidence seems to support the need for vocationally oriented high school programs, high school programs having a "pre-technical" orientation, and programs to meet the needs of the mentally and physically handicapped.

Employment opportunities exist in wood utilization and forest products occupations. Most of these occupations require the type of preparation that can be provided in high school vocational programs. Harvesting and transporting occupations also fall into this category. While instruction and experiences concerning the use of forest lands and resources should be provided, the instructional programs should focus on the occupations in which employment can realistically be expected. The outdoor oriented transporting and harvesting instructional programs are attractive to students and teachers alike. But how much emphasis is being given to wood utilization and forest products occupations?

Vocational education in forestry can serve another pur-

(Continued on next page)

MARCH, 1970

From the Editor . . .

Secondary School Principals similarly contends that "designating some schools as 'academic' and others as 'vocational' could ultimately lead to divisions among the students themselves" which would "largely coincide with social-class lines" resulting in "undesirable social stratification."

Another of the emerging points of view breaks sharply with the narrow, traditional concept held by some that skill training is the primary if not the exclusive concern of vocational education. The new concept is put clearly in the Advisory Council's 1968 report when they state "vocational education cannot be meaningfully limited to the skills necessary for a particular occupation." They list as appropriate aspects of vocational education to "help a person to discover his talents, to relate them to the world of work, to choose an occupation, and to refine his talents and use them successfully in employment." They imply another rather general outcome with the proposal that vocational education "is also a teaching technique which may have even more to offer as method than as substance." The Massachusetts Institute of Technology's 1965 Summer Study of Occupational, Vocational and Technical Education concluded also that "current vocational education should be expanded and generalized" to provide for "intellectual growth along both academic and vocational paths." They emphasize that "education for vocational competence should build in flexibility and adaptability to produce transferable knowledge and skills."

A third emerging concept has to do with the clientele of vocational education. The MIT Summer Study recommends that "some of the new vocational education should be part of the educational experience of *all* students." The 1968 report of the Advisory Council states that "some type of formal occupational preparation must be a part of every educational experience" which means appropriate occupational education for students in elementary schools, junior high schools, and senior high schools. The Secondary School Principal's Committee on Secondary Education says "a complete program of vocational education begins when the individual enters school."

Teachers of agriculture, state and local supervisors, and teacher educators—as well as all in vocational education—need to be aware of these emerging points of view which hint, in a not so subtle fashion, of changes that are being made or may be forthcoming in vocational education. Our first responsibility is to appraise the adequacy and soundness of these generalizations; but it is equally important that we study, think about, and experiment with the new ideas and their import for current and new programs of agricultural education. Will agricultural education be a significant element of the "new" vocational education?—JRW

Guest Editorial . . .

pose. Many occupations in forestry require varying degrees of post-high school education. This may be of short duration such as a lumber grading school or longer term programs offered in two-year institutions or four-year colleges.

We need to inform students about employment opportunities available, requirements for education beyond high school and where appropriate post-high school education can be obtained. Instructional programs should provide pre-technical subject matter plus practical experiences in forestry needed to successfully enter post-high school programs. The practical experience component is especially important as many continuing education programs are interpretive and lack the opportunity for students to gain practical experience. But do we know what the forestry profession considers to be important subject matter and what experiences are appropriate?

Forestry education provides a vehicle to reach many potential high school dropouts as well as students who are physically or mentally handicapped. We should help these students gain enough education to become employed and be productive citizens. We should identify these people and be sure we are not penalized should they not enter the forestry industry.

Realistic programs of vocational education in forestry should become an important part of agricultural education. We need to develop better lines of communication with professional foresters. It is essential that we gain their support for our programs. Opportunities exist for vocational, pre-technical and special education programs at the high school level. Special attention needs to be given to the development of forestry programs in urban schools. Can we meet this challenge? If we do not, some other group will!

Themes for Future Issues

April	Instructional Programs in Agricultural Production
May	General and Practical Arts Education in Agriculture
June	Evaluation in Agricultural Education
July	Agricultural Education in Post-Secondary Schools
August	Adult Education in Agriculture

THE COVER PICTURE

High school vocational agriculture students in Washington State show two of the many skills learned in the forestry laboratory. The forestry laboratory provides opportunities for students to develop skill and understanding in soil classification, land measurement, scaling, tree planting, tree growth and identification, trail building, pruning and thinning, spraying, and the use of technical forest tools. (Photos by Alex Crewdson, State Supervisor, Olympia, Washington)

WORK EXPERIENCE: Essential in Preparing Forestry Technicians

HERMAN W. WESKAMP
Mount San Antonio College
Walnut, California
and

ROYAL M. MANNION, Angeles National Forest
Glendora, California

"Hit it!" "Shoot it!" "Capture!" "Bump up!" "Guns!" "Hot spot!" "Roller!" These are words shouted by young men from city and urban living as they give directions and signals on the fireline. These directions and signals are used to increase their performance and efficiency as hotshot crew men—forest fire fighting specialists. These kind of high interest, high morale, and intense physical work is the beginning of a career in forestry.

Contrary to popular belief, the majority of forestry majors in the West come from city or urban life. In the program at Mount San Antonio College, over 90 percent of the forestry students have had little or no contact with the men working in this great outdoor occupation until they enroll in the forestry program. What they know of forestry is what they may have seen on a vacation or on television. These statistics are in keeping with trends in other agricultural occupations—farm youth look for a glamorous life in the city and city dwellers look for an adventurous life in an outdoor, fresh air environment.

Employment Opportunity

Southern California is unique in its chaparral covered watersheds that are

subject to fire from spring until late fall. This ever-present danger requires a large seasonable buildup of manpower to meet the needs of fire control forces.

Many of the people working for the U. S. Forest Service and the California Division of Forestry—the main fire suppression organizations in Southern California—are students working in summer jobs. This provides the student with an excellent opportunity to gain experience, thereby helping him to qualify for future permanent employment. In addition, seasonal employment gives the student an opportunity to earn the financial assistance so often needed to continue his education.

Program for Technicians

To increase further the opportunities for young people who are looking for a future in forestry, Mount San Antonio College expanded its forestry curriculum to include technical training. To offer the best possible kind of training, an effective cooperative operation was developed with the College and the local forest agencies in the area through the Southern California section of the Society of American Foresters.

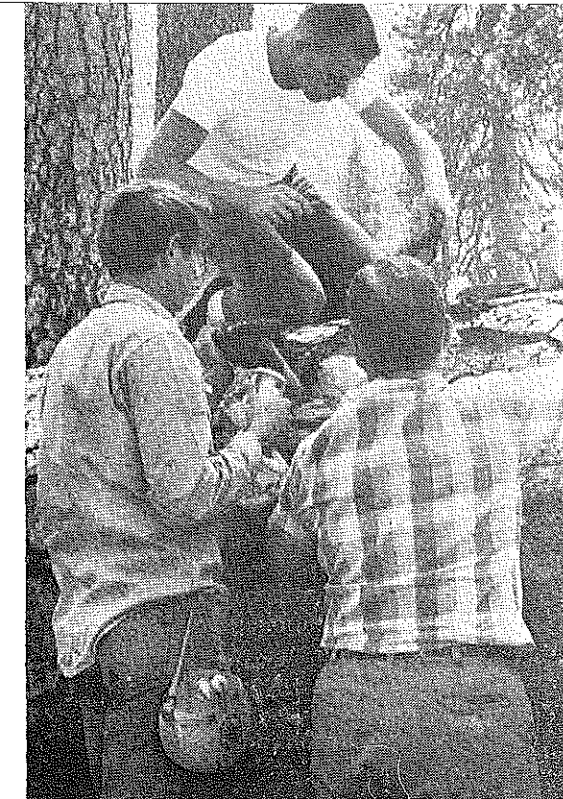


Royal M. Mannion

Herman W. Weskamp is Instructor (Agricultural Sciences) at Mount San Antonio College, Walnut, California. Royal M. Mannion is Assistant District Ranger, Mt. Baldy District, Angeles National Forest, Glendora, California. Mr. Mannion is Chairman of the Education Committee of the Southern California Section of the Society of American Foresters.



H. W. Weskamp



The forestry technician program includes much practical instruction under field conditions. (Mount San Antonio College photo)

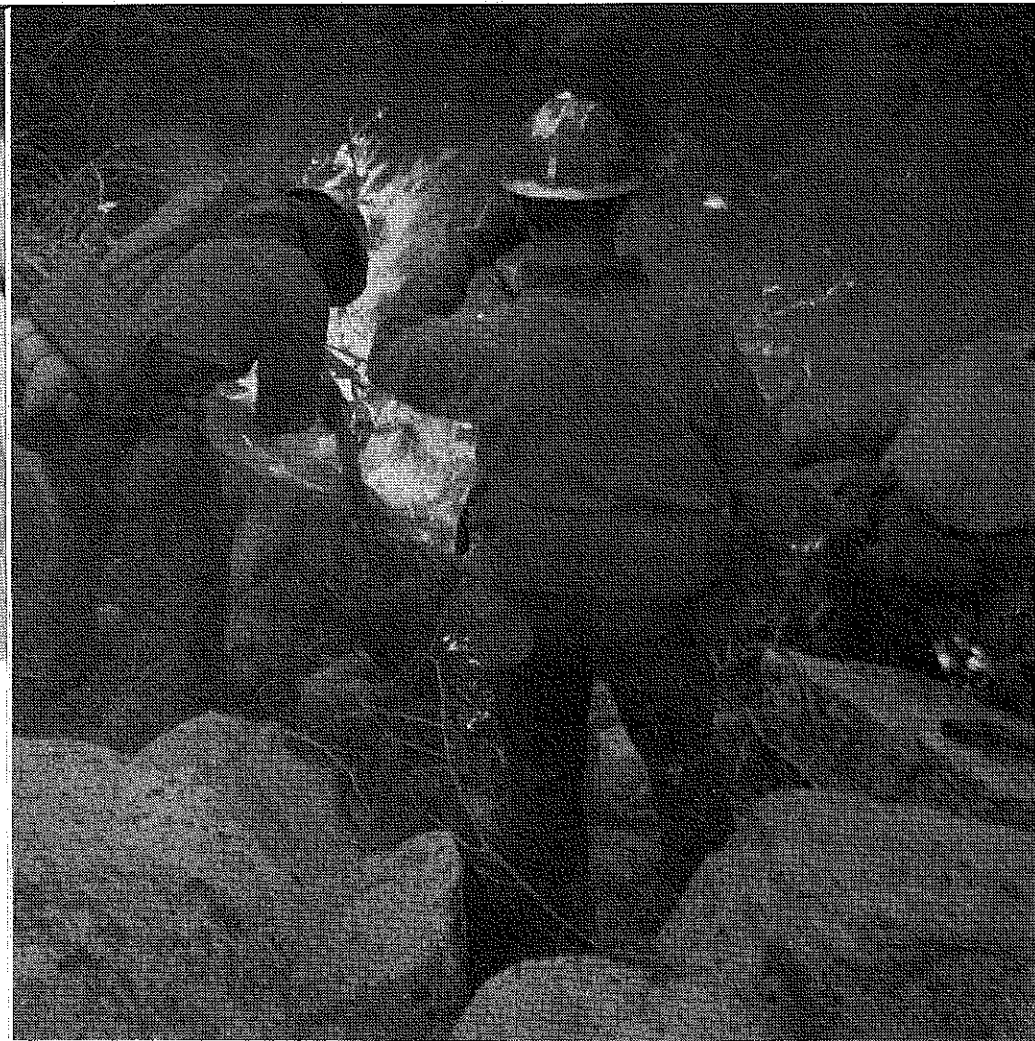
In the fall when the fires are still a danger, many student fire fighters return to the classroom. As a result, Mount San Antonio College forestry students have formed a reserve hotshot crew. The reserve hotshots are organized and brought together by telephone or by direct communication on campus. They will respond as back-up forces for the initial attack units on fire-line work, primarily in the local area to avoid extended absence from the classroom.

Through the facilities of the Mt. Baldy District, Angeles National Forest, the new student who has not had experience on the fire line is given basic fire training. This training is often obtained by working with the regular fire crews. Additional training opportunities through the year are offered by the California Division of Forestry and the Los Angeles County Forestry. Upon completion of the basic fire training, the student is qualified to join the reserve hotshot crew.

Work Experience Projects

In order to broaden the students' scope of forestry work, a variety of other work experience projects have been

(Continued on next page)



Forestry students at Mount San Antonio College receive experience during the summer in fire training. (Photo by Charles Hartley)

The forest technician fits between the skilled forest worker and the professional forester. His education and training enable him to understand the reasons for and the purposes of the task for which he is responsible.

The Society of American Foresters recommends that three-fourths of the technicians' training be practical with one-third to one-half of the training outdoors under field conditions. About one-half of the two-year forest technician program should be devoted to instruction in communications, business and record procedures, technical math, and graphics and surveying. Special emphasis should be placed throughout the program on human relations as a basic ingredient in maintaining good working relations in an organization and with the public.

The professional forester differs from the aid and technician in that he has earned a college degree from a school offering professional training in forestry. His education includes basic work in the sciences, engineering, and humanities. As a minimum, the professional training must include forest economics, forest protection, resource management, dendrology, ecology, forest mensuration, forest policy, and administration.

Recommendations

Whether the program is a high school vocational program, a post-high school technical program, professional education, or just job orientation, we strongly recommend that local forestry agencies and organizations be used to help develop and operate the program. Individuals who have an idea of what their future studies offer make much better students and more satisfied employees. The use of work experience gives the student future assurance and a better understanding of the work ahead.

Although forestry aides can through on-the-job experience and training advance to the technician's level, most employers prefer the candidate to have college training. Encouraging the student to work for the highest goal his ability will permit should be practiced at all times.

elbows with the people with whom they plan to work in the future. As the student progresses through the programs, he is constantly looking to the future and full-time employment.

Careers in Forestry

There are various opportunities for individuals desiring a career in forestry. There are opportunities for the high school vocational graduate, technicians completing a two-year college program, and the forester who is a college graduate. The general guide for public and private forestry indicates a ratio of personnel in forestry approximating 25 vocational aides to 15 technicians to 10 managers.

With high school graduates forming the largest population of employees in forestry, there is a need for vocational training at this level. The jobs for individuals with high school training cover the spectrum of skilled workers such as woodsmen, mill workers, recreation aides, fire control aides, clerks, and tradesmen.

developed. Most of these are in forest development and management such as reforestation, insect control, recreation area development, and trail work. Typical projects include felling and spraying insect infested trees, implementing a program in reforestation, or assisting with grass reseeding after a fire to prevent flood disasters. In recreation the projects include helping to lay out a new campground, checking, improving and repairing a trail camp site, or developing a nature trail in public accessible areas.

In addition, students may work in the field with a forester or be employed part-time by one of the agencies to gain specific job training. Also, the Southern California Section of the Society of American Foresters, Southern California Wildlife Society, and other conservation organizations extend invitations for students to participate in their meeting activities.

These on-the-job experiences have added considerably to the understanding of students. They now have rubbed

COORDINATING THE WORK OF STATE AND LOCAL ADVISORY COUNCILS

JULIAN M. CARTER, Supervision
Vermont Department of Education



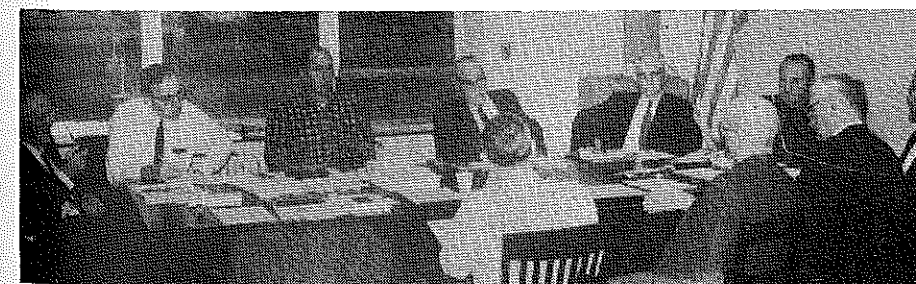
Julian M. Carter is State Consultant for Vocational Education in Agriculture, State Education Department, Montpelier, Vermont.

Julian M. Carter

The Vocational Education Amendments of 1968 require that each state establish an advisory council to "advise the State Board" and to "evaluate vocational education programs". In Vermont each service area has a State Advisory Committee. The Chairman of the State Advisory Committee for Vocational Education in Agriculture is a member of the Advisory Council. Also, local craft or consultanting committees are formulated to advise and work with agricultural teachers and school officials in Vermont.

• State Advisory Committee

The membership of the Vermont State Advisory Committee for Vocational Education in Agriculture includes four dairy farmers, a Christmas tree grower, a plant science specialist from the Vermont Department of Agriculture, two agribusinessmen, the vice-president of the Vermont Association of the FFA, a representative from the Vermont Association of Teachers of Agriculture, a teacher educator from the University of Vermont, a poultryman, a farm equipment dealer, and a representative from the Cooperative Council.



Members of Vermont's State Committee for Vocational Education in Agriculture include (from left clockwise around the table): Dr. Elmer Towne, Chairman; Julian M. Carter, State Consultant and Secretary; McDonald Miller, Poultryman; Edward Gray, Dairyman and Farm Machinery Dealer; LeRoy Ware, Cooperative Council; Wilfred Kelly, Vermont Department of Agriculture; William Farrar, Vermont Association of Teachers of Agriculture; Forest Dodge, Agribusiness; Cola D. Watson, State Director of Vocational-Technical Education; and William Kelly, University of Vermont.

Local consultanting or craft committees in Vermont are usually composed of from five to seven members. It is recommended, at the local level, that each instructional area such as Farm Production and Management and Forestry have their own committees with efforts made to coordinate activities as needed.

• Coordination

For the past two years an all day, state-wide meeting has been held with members of the State Committee, teachers of agriculture, and representatives of local consultanting committees in attendance. The agenda included reports from both the state and local committees, workshop sessions, and a discussion of mutual problems including ways and means of coordinating activities and improving communications. Organization techniques applicable to local situations were formulated.

Typical activities reported by local consultanting committees included evaluation of programs, developing ways and means of improving occupational experience activities, planning new facilities, formulating equipment

lists, assisting with local fairs, reviewing and approving courses of study, surveying employment opportunities in agribusiness, and working with area center advisory committees.

Problems mentioned by local consultant committee members were understanding their functions, communications with school officials, poor attendance at meetings, lack of meaningful problems for consideration, formulating programs for the slow and the exceptional student, and the involvement of school administrators and guidance personnel.

In addition to the annual state-wide meeting, each year a list of suggested activities is sent by the chairman of the State Committee to the chairmen of the local committees. As a result of this procedure, many problems receive attention in several areas of the state. The procedure also serves to encourage local people to refer problems and to offer suggestions to the State Committee.

Recently the chairman of the Vermont State Council for Vocational Education met with the State Committee for Vocational Education in Agriculture. He stated that one of the main functions of the Council is to evaluate programs and to make recommendations to the State Board of Education. All state and local consultant committees will be involved.

• Summary

State and local advisory committees composed of knowledgeable lay people can be of assistance to the agricultural education program. The all-day sessions described in this article and the two-way communications between the chairmen of the state and the local committees helps to coordinate the activities of the two groups in Vermont.

Instructional Program for Forest Rangers

WALTER R. KNUDSEN
Lake City Junior College and Forest Ranger School
Lake City, Florida

Lake City Junior College and Forest Ranger School, located 60 miles west of Jacksonville, Florida, offers three instructional programs in forestry. They are the Forest Ranger Program which will graduate its twenty-third class in August 1970, a Timber Harvesting Program which is in its third year of operation, and a two-year pre-forestry program which came into being seven years ago when the Junior College joined the Forest Ranger School.

Students

Students in the Forest Ranger School, which is one of the two oldest schools of its type in the United States, are selected from a large number of applicants, most of whom are from the southeastern United States. There are exceptions, however, as a number of foreign students have successfully completed the Forest Ranger Program.

Most applicants have one thing in common—the desire to work outdoors. There is one other factor which, unfortunately, many applicants have in common—a weak background in mathematics, particularly algebra. Too few high school counselors are aware of the mathematical requirements in forestry. The curriculum for a pre-forestry student includes algebra, trigonometry, analytical geometry, and calculus. These must be completed before the

student transfers to a four-year institution to complete the requirements for his degree in forestry.

Courses

The program followed by students in the Forest Ranger Program includes the following courses.

—Forest mathematics: algebra, geometry, and trigonometry with an introduction to the concepts of probability, basic statistics, and distribution theory.

—General forestry: lecture and laboratory work on the basic principles and general practices of forestry.

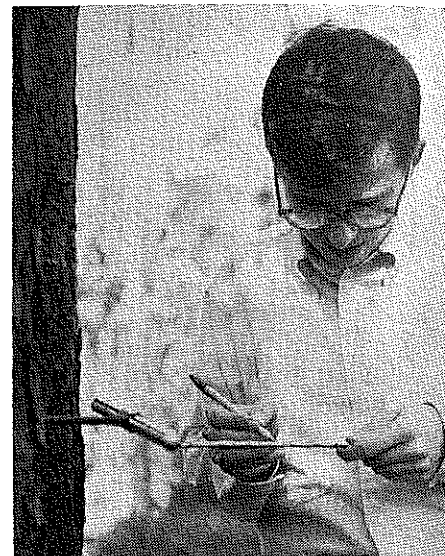
—Forest protection: lecture and field study of fire behavior under controlled and uncontrolled conditions; field practice in prescribed burning and fire protection; damage and control of major insects and diseases of the nursery and forest.

—Forest drafting: laboratory instruction in use of drafting equipment to expedite forest mapping.

—Dendrology: lecture and field study of important forest tree species in the United States including taxonomy, relative importance, and silvical characteristics.

—Botany and soils: physiology and structure of higher plants with emphasis on plant-soil relationship.

—First aid and safety: study of stan-



A student checks the age of a Slash Pine.

dard safety practices, first aid procedures on-the-job and in-the-home including emergency procedures.

—Wildlife and recreation: an introduction to multiple use concept of producing wood and wildlife while maintaining the aesthetics necessary for recreation.

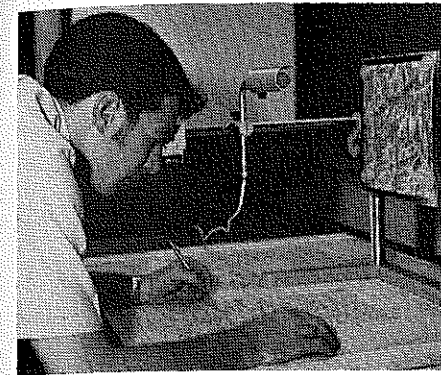
—Introduction to computerized forestry: general introduction to the history, basic concepts, features, and language of electronic computers with emphasis on forestry applications and uses; methods and techniques of gathering field data for computer analysis.

—Forest photogrammetry: application of the use of aerial photographs for forest management.

—Forest mensuration: instruction in wood measurement, tree measurement, and timber cruising with field practice in scaling, measuring, and mapping.

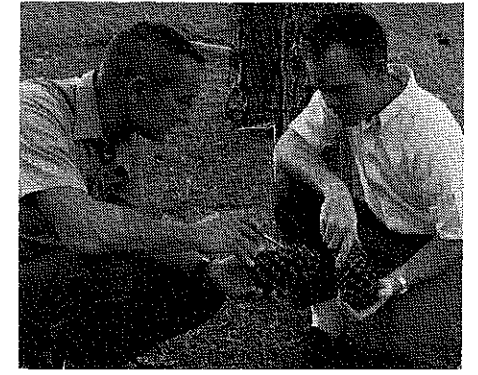
—Artificial reforestation: study of life cycle of the principal southern pines with field work in nursery practice, direct seeding, and tree planting.

—Logging and lumbering: study of



(Left)
Up-to-date optical equipment is used in map construction.

(Right)
Students in the Forest Ranger School learn to identify species by cone characteristics.



fundamentals of logging, lumber production, and pulpwood production, methods, and machinery.

—Forest surveying: development of skills in plane surveying and planimetric and topographic mapping.

—Silviculture practices: study of silviculture and regional forestry practices and exercises in methods of thinning, pruning, and improvement cuttings.

—Forest economics: study of economics as it applies to forestry in today's business world including timber sales, contracts, equipment costs, and law.

—On-the-job training: 142 hours of field work under actual field conditions with employees of each of the various forestry agencies including the United States Forestry Service, an industrial land firm, a sawmill operation, and a logging operation.

—Student tour: tour of the Southeast to see, at first hand, species of trees, topographical features, forest industries, and forest management activities.

—Human relations: study of funda-

mentals of human nature to develop understanding, tolerance, and better relationships; development of leadership qualities and high ethical standards with emphasis on discovering workable patterns for solving problems.

—Communicative skills: study of composition and rhetoric, with emphasis on clear, effective self-expression in writing expository essays, themes, and research papers.

—Fundamentals of speech: development and improvement of basic skills of speaking and listening through classroom exercises, oral reading, and public address.

Graduates

The program is very successful as each graduate has a choice of several jobs. Many students are interviewed and hired from four to six months before graduation. At the present time there is a waiting list of employers. Most of the graduates are placed with the pulp and paper industry, but many go with the United States Forest Service, various state forest services, lum-

ber companies, surveyors, consultants, United States Park Service, fish and game departments, and the forest products industry.

The one-year Forest Ranger Program is the most rigorous on campus. The students attend class from seven to eight hours a day, five days a week. During the first semester, most of the time is spent in the classroom or indoor laboratory, but as the student progresses, more and more time is spent in the field. The summer terms are virtually all field work. Nearby Osceola National Forest serves as a 157,000-acre outdoor lab.

Timber Harvesting

The Timber Harvesting Technician program originated as a result of the need by wood using industries for trained men to be employed as pulpwood producers, wood dealers, and logging foremen. The American Pulpwood Association lends its support and backing to the program by offering professional foresters as consultants, woodlands on which to work and teach, equipment to operate, and financial support. There is a great shortage of trained personnel in the logging industry in the South; and with a great demand for wood by ever expanding mills, employment possibilities are excellent for young men who are willing to work.

All of the forestry courses are taught by professional foresters with a wide range of experience. The forestry staff consists of five full time foresters and one consultant. The combined staff has a total of over one hundred years of experience in the field of forestry.



Walter R. Knudsen

Walter R. Knudsen is Director of the Forest Ranger School at Lake City Junior College and Forest Ranger School at Lake City, Florida. Before joining the staff five years ago, Mr. Knudsen was on the faculty of the School of Forestry at the University of Florida where he taught forest photogrammetry and conducted research in aerial photography.

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Forestry Instruction in the Vocational Agriculture Program

B. M. DILLARD
Area Adult Teacher of Forestry
Fairburn, Georgia



B. M. Dillard

Forestry is a billion dollar industry in Georgia, second only to the textile industry. Almost twenty-six million acres of the total thirty-seven million acres are in commercial forest land. Fifty-five thousand

people are either directly employed by the forest industry or have equivalent full-time jobs in wood harvesting.

Some 6,919,238 cords of pulpwood were produced in Georgia in 1968. In addition, 1,052,238,000 board feet of saw timber was cut in Georgia in 1967. These facts substantiate the emphasis on forestry in the instructional program of vocational agriculture in Georgia.

The Need

Forestry in the instructional program dates back to the origin of vocational education in agriculture in the state. Sections of Georgia have never been "out of the woods," so forestry has traditionally been a crop or cash reserve to the total farming program. In areas where the livelihood of the inhabitants is largely dependent upon forestry resources, strong local programs in forestry naturally evolved in vocational agriculture.

The ceiling came off the forest industry potential with the coming of the pulp and paper industries to the state. In the fifties a formal acknowledgment was made of special course offerings in general forestry. A cooperative program between the forest industry and vocational agriculture was initiated to offer specialized courses utilizing professional industrial foresters as

resource personnel. The forest industry also set up an incentive program for students excelling in forestry.

More pulp and paper mills located in Georgia until only the most remote counties having high rail rates or no rail transportation had a poor market for wood. The trend toward trucking larger volumes of wood over longer hauls penetrated even these remote areas. Many acres reverted from farm land back to woodland.

In 1965, one company requested personnel in vocational agriculture to explore the possibility of offering instruction for vocational agriculture students in wood harvesting. A committee composed of representatives from the forest industry, State Department of Vocational Education in Agriculture, school administrators, teacher education staff from the University of Georgia, and the American Pulpwood Association studied the possibility of specialized instruction in forestry in vocational agriculture. Committees were appointed to take positive steps toward implementing specialized courses in the vocational agriculture program. These steps included an investigation of the extent of the need, arrangements to develop a curriculum, preparation of teachers, and instructional materials based on the curriculum adapted to secondary school usage.

The Program

Only with tremendous support from industry and many dedicated individuals were we able to make the program functional. One problem facing the forest industry became acute because of a rapidly diminishing labor supply. This trend forced entrepreneurs into highly mechanized systems of wood harvesting requiring skilled

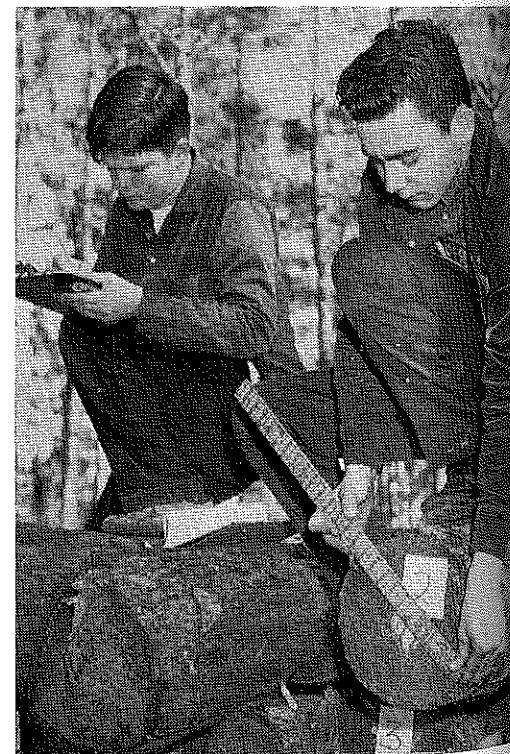
equipment operators, cost conscious production minded managers, and safety oriented foremen who needed some background for this revolutionary change of operation.

The instructional program in forestry is designed to meet four needs indicated below.

—Introduction to forestry covering basic units such as importance, tree identification, principles of plant growth, and elementary forest measurements. This introductory course, offered in the first two years of high school, is somewhat pre-vocational and orientation centered.

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Vocational agriculture students at Central High School, Thomasville, Georgia, learn to scale pulpwood in a specialized forestry course.



Some Approaches for Counseling Students

DAVID G. CRAIG, Teacher Education
University of Tennessee



David G. Craig

The modern vocational agriculture teacher wears many "hats" in carrying out his professional duties. In any one day he teaches, counsels, advises, supervises, and listens to students, faculty, administrators, parents, employers, and employees. He encounters students with many individual differences at the junior and senior high school level, young and older adult education levels, and those who are disadvantaged. The role of the teacher is further complicated by the kinds of problems students have. These problems may be classified as socio-psychological, academic, and vocational.

COUNSELING SITUATION

Teaching may be defined as guiding the learning process. This statement implies that guidance is closely related to teaching as well as to getting along with students. Guidance may be defined as helping students to learn about themselves and projecting this information toward making wise educational and vocational choices. Counseling with students, one aspect of guidance, will be the primary focus in this article.

Here are some problem situations in which a vocational agriculture teacher may be involved in counseling students.

A junior student says, "Gee, Mr. Drake, I want to go on to college, but agriculture conflicts with chemistry next year. What should I do?"

A nineteen-year old asks, "Why did

you put me in this shop class of dumb kids? I can fix a gas engine faster and better than any one of those other guys?"

In making plans for next year, the new FFA officers want to involve girls enrolled in vocational agriculture in planning and carrying out the program of work.

During a young adult welding class, one student says, "What this town needs is a good welding repair shop. Would you help me start my own business?"

How would you counsel the individuals in each situation?

COUNSELING PROCESS

I suggest that teachers go through a basic series of steps in order to counsel students effectively.

Preparation. Prior to counseling a student or group of students, the teacher needs to prepare himself. Some of these preliminary considerations include the situation, the cause of the problem or questions, alternative solutions or answers, and possible courses of action to follow.

Introduction. In this step the teacher and student come face to face to discuss a problem or question. The counseling situation may take the form of an appointed time for an interview or as an impromptu, short discussion. The latter may occur in the classroom, shop, in a place of business, on a farm, or elsewhere. Some problems will require office privacy, others will require parents, employers, or others to be present. Frequently the tone of the counseling process is established at this time.

Stating the Problem. In some cases background information must be pre-

sented and the situation reviewed in order to state the real problem. In other cases, the problem may have been identified in the situation from which the counseling activity evolved. It is important that the counselor and student agree on a simple statement of the problem.

Identify Problem Solutions. Hopefully, both the teacher and the student can contribute some possible hunches, solutions, or answers to the problem or question. For the purpose of eventual decision making, it is best if at least two or more alternative solutions can be identified.

Gathering Facts and Information. This step often begins with a question: Which of the solutions is best for this particular problem? Information can be secured from publications and pamphlets, audio-visual materials, visits and interviews, and work experiences as well as from the involved individuals. Students who are actively engaged in seeking answers to their problems will be better prepared for the next step.

Making a Decision. The teacher may wish to take an active leadership role in assisting students to use the information gathered and to weigh the solution alternatives. This step requires critical thinking and reasoning. In most cases, the student should be encouraged to make his own decision and live by it.

Follow-up. Follow-up of the counseling experience is essential for at least two reasons. First, the teacher needs to observe the results of the action or decision made by the student. If a decision failed, another one will need to be made. In some situations, one might have to go back to the beginning of the counseling process and re-identify the problem. Secondly, follow-up is necessary to evaluate the effect of counseling on the student. Was the student helped? Was the problem solved? Was the question answered?

This series of steps points out that counseling has at least two important characteristics. First, it should be a systematic process for most effective results. Second, it requires reflective and rational thinking on the part of the teacher and student. A third feature of counseling has to do with the leadership approach displayed by the teacher.

(Continued on page 225)

Forestry Instruction for Post-Secondary Students

EVERETT E. DAVIS, Assistant Director
Missoula Technical Center
Missoula, Montana

Post-secondary forestry students at the Missoula Technical Center in western Montana experience a unique instructional program in forestry technology. The primary purpose of the two-year program is to expose students to the profession of forestry while teaching the skills required for technical positions in the forest industry.

The program is best understood in light of the importance of forestry to the economy of western Montana. The city of Missoula is the hub of a vast natural resource based economy including federal and state regulatory agencies and research and educational branches of forestry as well as private industries using forest products.

Strengths

The strength and growth of the program are based on several factors.

—The forestry program has the strong backing of local forestry organizations.

—A close working relationship is maintained with the Missoula offices of the U.S. Forest Service, the State Foresters' Office, the School of Forestry at the University of Montana, and private logging operations.

—The Missoula Employment Security Commission Office in their fiscal 1970 forecast identified 380 job openings in forestry available in Montana.

—The broad training a student receives enables him to easily find employment in all regions of the United States.

The author acknowledges the assistance of the following persons at the Missoula Technical Center in the preparation of this article: Thomas E. Downey, Director; Alfred L. Chase and William MacDonal, Instructors; and Charles R. Couture, Guidance Counselor.

—U.S. Civil Service Commission recognizes the technician program for placement on salary scales.

—A local advisory board composed of federal and state forest officers, private industry representatives, and university personnel lend assistance to administration and staff in developing course content and field activities.

Impetus for the current forestry technology program is provided by the nationwide demand for forestry technicians as well as state and local requirements. Designation of the Missoula Technical Center as a state post-secondary vocational-technical center has enabled the local board of trustees and administrative staff to utilize state and federal vocational funds to provide a curriculum of significant value to potential forestry technicians.

Curriculum

The curriculum is approved by the Montana Department of Public Instruction and the Montana State Board of Vocational Education. Programs are further approved or accredited by the United States Office of Education, Veterans Administration, Bureau of



Field trips are frequently conducted to observe logging operations.

Indian Affairs, Division of Vocational Rehabilitation and various other agencies.

The primary objective of the program is to expose all students to the general phases of forestry while equipping them with the technical skills required by the forestry profession. Approximately thirty forestry and forestry related subjects are covered during the two-year training period. Silviculture, surveying, dendrology, ecology, aerial photography, forest management, logging, mathematics, and technical communications, are examples of the instruction provided by a staff experienced in both the private and public sectors of forestry.

Classroom study provides students knowledge of the principles and problems encountered on the job. Exercises conducted in the field reinforce the principles learned in the classroom and assist in developing the skills required by business and industry. Field trips to forestry operations and public forests, summer employment, and on-the-job experience enable students to receive "hands on" practicum in timber cruising, forest surveying, recreation management, forest research and forest engineering.

Cooperation received from the U.S. Forest Service and the University of Montana School of Forestry permits utilization of work experience and experimental forests by the instructional staff in this important phase of the training. Experience is thus received through both theoretical and practical approaches to "on-the-ground" problems.

Two unique experiences provided the students during the fall quarter highlighted the practicum phase of the curriculum. Students were introduced to an innovative practice of

thinning forest stands with fire. A specially arranged lecture followed by field application enabled students to receive first hand knowledge of this technique. In addition, the students were introduced to cat and cable logging techniques especially applicable to logging large volumes per acre of virgin timber.

Students

The typical forestry student at Missoula Technical Center is single and between 18 and 26 years old. He has at least a high school diploma, although a few students have some post-secondary educational experience. Only one of the thirty-five students is from out of the state. This is due to the large number of applicants from within the state and the shortage of space available for training larger numbers. Thirteen of the thirty-five students receive some financial assistance from one of several agencies (Bureau of Indian Affairs, Veterans Administration, Vocational Rehabilitation) or are on a college work-study program.

The students are interested in living and working out-of-doors, are fairly adept in human relations, have an average or better background in the communication skills, and have an above average operational mastery of mathematics. Through individualization of instruction students are permitted to progress at their own rate based upon previous educational background and work experience. Placement services are available to all students prior to graduation and often forestry personnel from out of the state seek qualified applicants.

Employment

The proof of the pudding for any vocational-technical program is the employability of the trainees. Business and industry, the local advisory board, and personnel departments of state and federal forest offices have worked diligently with the Missoula Technical Center administration and staff to insure that proper training and work experience are provided in the program. Forestry technicians are in demand throughout Montana and the nation. The Missoula Technical Center forestry program is designed to prepare qualified technicians to take their place in the world of forestry.

Forestry Instruction in Vocational Agriculture

(Continued from page 222)

—Concentration on a specific problem area in forestry which may be expedient to the student's production agriculture program of which forestry is a part. It is the teacher's responsibility to identify this problem and deal with it if there is a substantial need. For example, a bark beetle epidemic may affect the farm woodlots of a number of vocational agriculture students.

—An elective specialized course in general forestry is offered to prepare students to enter the labor market as a forest technician, forestry aide, or assist a professional forester in managing commercial forest land. This course is also offered for those students aspiring to major in forestry in college. Some students, however, take this course because forestry is a major part of their farming program. This specialized general forestry course is offered in 41 high schools in Georgia.

—An elective specialized course in wood harvesting which encompasses the principles of operating a small business is offered in 19 schools. It gives the student background to accept a job with the forest industry at the entry level with expectation of eventual advancement toward the wood harvesting phase of the forest industry.

Post-High School Programs

Two area technical schools offer a post-high school course in wood harvesting technology. Some high school graduates choose to further their training at these centers.

Adult instruction is an important phase of the vocational education in agriculture program. The responsibility of identifying the problem areas in forestry rests with local teachers. Teachers coordinate these classes in their schools and rely to the area forester for help in preparing the material applicable to the problem.

There are 118 vocational agriculture school forests in Georgia which serve as a laboratory for experimentation, supervised practice, and practical application. The forestry field day contest is designed to complement the instructional program in forestry.

Some Approaches for Counseling Students

(Continued from page 223)

LEADERSHIP APPROACHES

As a teacher follows the counseling process, he has the opportunity to adapt his leadership approach to the situation. That is, he may be very directive, very indirect or use both directive and indirect influence in any counseling situation.

The teacher who uses a more direct approach usually shows much influence during the counseling process. He moves through the steps rather rapidly. He does most of the talking and asks a few questions. As a result the student does not become deeply involved in the thinking process. Directive counseling tends to occur in the stress of time and when immediate decisions need to be made.

When using the nondirective approach, the teacher begins the counseling process by trying to create a friendly and permissive atmosphere. The teacher does not talk very much but asks many questions. The purpose is to draw ideas and reactions from the student in helping to solve his problem. This approach lends itself to those situations where time is not a factor and when the focus is on a more personal problem.

Some teachers may choose a combination of both the direct and indirect approach. This affords one the flexibility to move rapidly through some of the counseling steps and more slowly at other times.

There are a number of factors that affect the leadership approach or degree of directness a teacher should use in counseling students. One important factor is the nature of the problem to be solved—personal, occupational, or academic. A second factor is the availability of time. Another factor is the maturity, age level, and past experience of the student being counseled. Fourth is the sources of help available. What assistance can the school counselor provide? Is there a need for involving parents or other adults? Finally, there is the personality pattern of the teacher. He needs to use the approach with which he is most effective in helping students solve their problems.

The Changing Nature of Forestry Education

HARRY L. MOSHER
The Pennsylvania State University

Educational institutions at all levels are beginning to take a closer look at programs for students interested in careers in forestry and related fields. Many high schools are studying the possibility of implementing programs in forestry or in the general area of agricultural resources. These relatively new instructional areas at the high school level are the result of new demands.

As the work-week is shortened and leisure time consequently lengthened, mankind naturally turns to the out-of-doors for recreation and revitalization. Marion Clawson in his 1960 book *Resources for the Future* made predictions about the demand for recreation in the year 2000 which were laughed at as being unrealistic, but today his estimates have been far exceeded.

As an example of new demand, the American public has enjoyed a 51 percent increase in outdoor recreation experiences alone during the last five years. These new demands have stimulated an increased need for more specialists in the fields such as recreational planning and development. Since much of the recreation is to be done in a forest environment, new restrictions are therefore being placed on the traditional use of forests for timber, water, wildlife, and forage. These demands, restrictions, and the consequent changes in objectives for the management of our resources require more efficient and productive use of personnel.

New High School Programs

Leaders in agricultural education are seeing these demands for new personnel and translating them into viable programs in many schools. The Pennsylvania State University through its School of Forest Resources and its Department of Agricultural Education is

rapidly developing new programs aimed at the entire range of employment.

The Department of Agricultural Education has recently developed a high school curriculum in agricultural resources which includes an array of subjects such as conservation of forested and other natural areas, fish and wildlife, soil, water, air, and the development and management of recreational areas. A high school program of this nature is uniquely designed to stimulate student interest in these subjects to the point where they will be encouraged to enter post-high school training programs. Only through high school programs of this nature can qualified individuals be attracted to newly developing fields of specialization.

Also being developed is a high school program in forestry. Students completing the program will be prepared for employment in entry positions of harvesting and protection. More importantly, they will have been exposed to the work environment of this out-of-doors occupation and would therefore have a sound basis and preliminary background for entry into post-high school programs.

The advantage of high school forestry programs cannot be stressed enough. Under the present system in many professional forestry schools, course offerings have been upgraded and forestry subjects are restricted to the final two years of college. Even when students complete forestry courses, they often find that course content places emphasis on the broad theoretical concepts and the development of managerial skills. High school programs in forestry thus offer unique opportunities for students to test their interest in the occupation in general. Specifically, high school forestry programs help stu-



Harry L. Mosher

Harry L. Mosher is Leader, Forest Technician Unit at the Mont Alto Campus of The Pennsylvania State University.

dents decide whether to take the technician track or the professional track in post-high school programs.

Programs for Technicians

A second area of interest is the increasing demand for technicians. The following definition developed by the Society of American Foresters' Committee on Training of Forest Technicians in 1965 describes what people in the forestry occupation mean when they describe an employee as a technician.

The forest technician is a person competent to occupy a responsible position in the line of authority between the skilled forest worker and the professional forester. He directs the activities of the former under the supervision of the latter, and must apply in a responsible manner proven techniques which are recognized as being professionally sound. The techniques employed demand acquired experience and knowledge of forestry, combined with the ability to work out details of a task in the light of well-established practice. The forest technician differs from the skilled and semi-skilled (vocational) worker in his knowledge of forestry theory and methods; and from the forester in his more limited or specialized background and in his use of technical skills in support of forestry activities. The senior forest technician occupies the area between the skilled forest worker and the forester at the end of the spectrum closest to the professional forester.

(Right)
Students in the forestry technician program at the Mont Alto Campus of The Pennsylvania State University prepare a plane table map of a proposed recreation area.

The forest technician requires an education and training sufficient to enable him to understand the reasons for, and purposes of, the operations for which he is responsible. He should speak the same language as the professional forester and appreciate the professional point of view. The forest technician does not need either the depth or extent of scientific understanding required of a forester, but he does need a practical working knowledge of the same subject matter. Technician training requires an educational approach different from and more academically rigorous than vocational or trade training. But in any case, it should be understood that the basic education given him will allow him to continue his personal development.

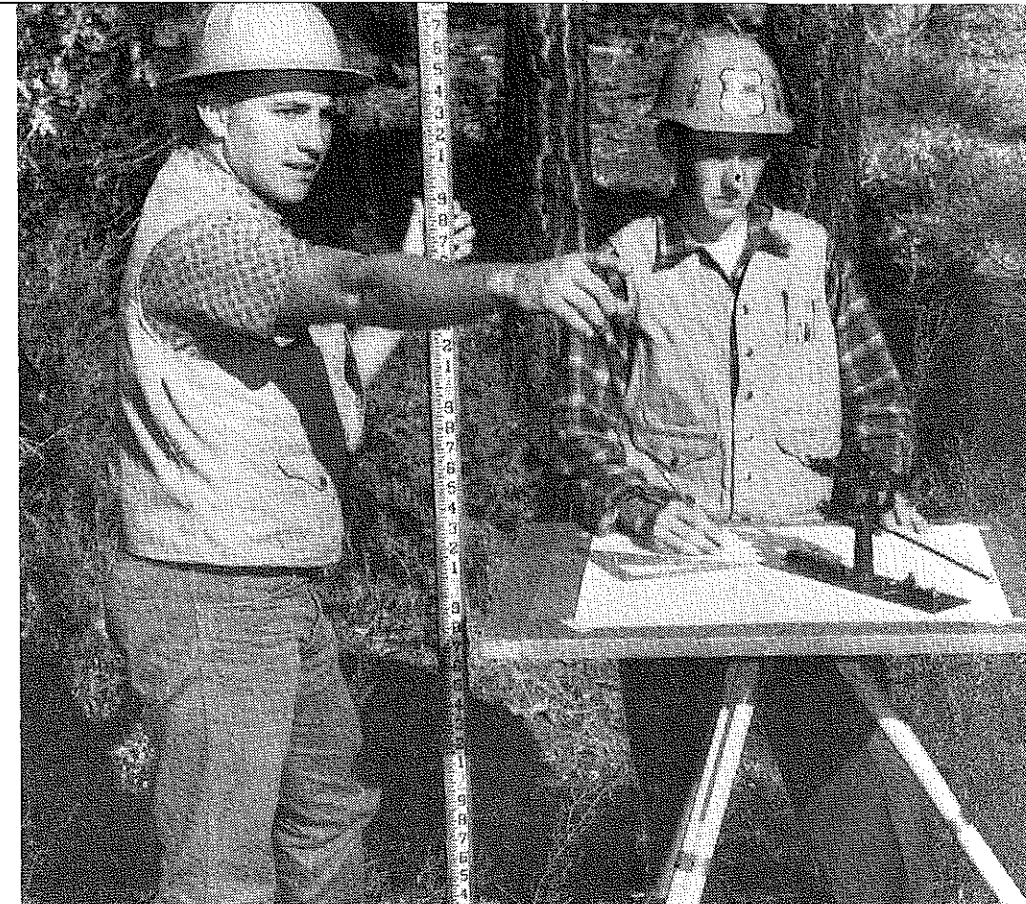
Studies by the Society of American Forester's Committee on Training of Forestry Technicians indicate that the demand for forest technicians will increase approximately 900 percent by the year 1980. This growth has resulted in the recent establishment of a wide variety of programs. For example, in Forest Technician Schools alone there has been approximately a 300 percent increase in the number of schools since 1963.

Forestry Technician Program

Following a study of the demand for forestry technicians, The Pennsylvania State University implemented a two-year Associate degree program in September 1963 at its Mont Alto campus where forestry had been taught since 1903. This program is guided by three major objectives for post-high school technical education.

—To present courses designed to meet the specific needs of the technician. These courses will not be designed primarily as transfer courses; but will be chosen so as to present the maximum amount of usable information on activities, methods, and techniques. Background material and theory is to be kept to a minimum and presented only in such quantities as is necessary if the student is to grasp the technical subject matter.

—To develop within the limited time of the program as high a degree of field skill as is possible. This is to be



done by recognizing that since forest technician training requires a somewhat different training schedule from that of other academic subjects, certain forestry courses should not be required to conform to the general academic schedule and therefore should be scheduled to provide extended field time to accomplish the specific objectives of the program.

—To supplement the technical phases of the program with general education courses geared to provide basic academic skills as well as to develop skills in communications and human relations necessary for the graduate's further advancement into supervisory positions.

Further effort is being made to implement additional technician level programs in wildlife and recreation. Each of these programs is designed to meet the specific new demands of the industry.

Additional signs of the changing nature of education in forestry is evidenced by the new name for the four-year professional program in forestry called "Forest Science" which more

properly signifies the emphasis on the scientific and managerial aspect of professional forestry education at the college level. A review of this professional program shows many changes from the traditional one. Biometrics has replaced mensuration and mathematics, statistics and computer science now receive increased attention, and traditional courses such as silviculture, entomology, pathology, and dendrology are refocusing their goals toward more in-depth scientific study.

Progress

It is clear that agricultural education, benefited by increased federal funds, is making rapid strides to meet the continued demands of on-farm education. In addition it is constantly alert to provide the full range of educational opportunities for off-farm occupations as well. As new demands emerge, it behooves all educators to continue to improve communication with each other in order to develop high quality, well co-ordinated programs throughout the entire spectrum of agricultural education.

Agricultural Education in Kenya

ROBERT H. MAXWELL, Teacher Education
West Virginia University

Every society has a way of transmitting knowledge and skills to the younger generation, particularly so in occupations that are of major importance. Kenya has a long tradition of agricultural education in this sense.

Many of the traditional practices of agriculture have been tested and proven in a setting which provided little freedom in their application. As technological progress provided new alternatives and sources of credit became available to balance some of the risks, new attitudes and a new awareness of the possibilities have given impetus to a massive and interesting program of agricultural education within the country.

• The Setting

Independence was celebrated in Kenya on December 12, 1963. It was on that day—and it remains—a land of diverse peoples, problems, and potentials. Sitting astride the equator on the eastern coast of Africa, Kenya shares many of the problems of her neighbors. The population growth rate is high; agricultural production is erratic; school enrollments are increasing dramatically. Unemployment is increasing; inflation is present. Charges of tribalism, graft, and corruption emanate from the political opposition. Africanization of commerce and industry is proceeding more slowly than some would like to see, and there probably are flaws in the government's programs of social services and education.

Often industrialization is proposed as the panacea for countries like Kenya where more than three-fourths of the population derive their livelihood directly from agriculture. However, the Kenyan government has justifiably set its course toward increasing agricultural production and rural employment as a prerequisite for pronounced industrial development. Nevertheless, a

sizable rural-urban migration is taking place, particularly among the younger people.

• Agriculture in Kenya

Diversity characterizes the agricultural sector. There are small holdings where all production is a result of hand labor. On the other hand can be found large scale, rather highly mechanized and fairly efficient farms of 1,000 acres or more. There are coastal farms of sisal or coconut groves contrasted with high altitude farms specializing in pyrethrum, small grains, or grass, dairy, and sheep production.

Some areas are well-watered but nearly three-fourths of the country is desert or near desert—much of it being used as communal grazing by the nomadic tribes. There are unimproved indigenous cattle and sheep that leave a great deal to be desired when compared with dairy or beef herds built upon imported breeding stock or local stock as the Boran whose breeders have now formed their own local breed association.

Many of the rural population are described as subsistence farmers, but subsistence is a relative thing. There are years when subsistence farmers feed their families quite well, and the nomadic tribes have more milk than they can drink. Then there are years when food is in short supply and peo-



Robert H. Maxwell

Robert H. Maxwell, a former vocational agriculture teacher in Iowa, served from 1960 to 1962 as an instructor in Kenya for the pilot project described in the article. In 1964, Mr. Maxwell returned to Kenya as West Virginia University's Chief of Party and served until 1968 as the Agricultural Education Officer in the Kenya Ministry of Education and as the University's field administrator on the project. He is currently on leave from West Virginia University studying for the doctorate at Cornell University.

ple (and cows) face starvation and death.

In the decades since World War I more and more emphasis has been placed on production of agricultural cash crops for export. Coffee, tea, sisal, and pyrethrum lead the list of foreign exchange earners for Kenya. Small grains are grown in many parts of the country, livestock production is increasing, and maize (corn) remains the stable food crop of the common people. A great variety of tropical fruits are produced and all the common vegetables are or can be grown.

In this setting, increasing agricultural production is of paramount importance to the health and well-being of an increasing population and for the stabilization and growth of the economy. Rather substantial amounts of capital from both the public and private sector are being invested in agriculture and the long term returns hinge primarily on one major factor—trained manpower.

• The Secondary Program

In an effort to build a base of manpower with agricultural interests and abilities, a pilot project was initiated in 1960 to test the feasibility of teaching agriculture in secondary schools in Kenya. A unique setting for this experiment was chosen in Western Prov-



A Kenya student gets experience in driving a tractor.

ince at the Chavakali Secondary School, a day school with solid community support in a very heavily populated area of small farms.

A trial course of study was developed and teaching was begun by an instructor provided under USAID contract from the United States. Buildings and equipment were also provided in the assistance agreement. In conjunction with the teaching at the school, students were encouraged to develop plots at their homes as demonstration projects as well as to apply in a small way the principles and practices they were learning at school. A youth club, "Young Farmers," was organized; visits were made to agricultural shows, outstanding farms, and research stations. Efforts were made to place selected students on farms for work experience during the school holidays.

In 1963 a Kenya Government evaluation team recommended that an additional six schools initiate an agricultural course as demonstrations for the surrounding schools. West Virginia University was asked to provide teachers to staff these schools during their initial phases and to give leadership to pre-service and in-service training of Kenyan teachers who would carry on the program.

Staff from West Virginia University arrived in Kenya in September 1964 and the teaching of agriculture was in full swing by the beginning of the following year. The provisional syllabus had been revised and approved by the educational authorities involved and recently has been approved as one of the secondary level subjects which may be offered students preparing for university entrance. The syllabus covers four years of secondary school instruc-

tion. Most schools have arranged a schedule that allows from four to six periods of instruction per week, roughly equivalent to that given to other secondary school subjects. In the course of the demonstration project, classroom-workshops have been constructed at all schools and tools and equipment have been provided through the US-AID agreement. Each of the demonstration schools has full boarding facilities for all its students.

Class time is split between conventional classroom presentations and more practical instruction on the school farm and in the workshop. All schools have a five to fifteen acre farm under the direction of the agriculture teacher and these have proved invaluable for introducing new practices and laboratory skill teaching in a host of different subject matter areas.

• Teacher Education

In-service courses are being scheduled regularly for the school vacation periods and a wide variety of topics has been covered. An agriculture section has been set up in the Curriculum Development and Research Centre in the capital city which will provide instructional and teaching materials designed for local situations.

In 1968 a professional teacher preparation program was initiated at Egerton College with initial leadership of West Virginia University's staff. As early as 1964 the government saw the coming need of locally trained agricultural teachers in secondary schools and began sponsoring students in this college for purely technical agricultural training. But only recently has the full range of professional courses been instituted.

Egerton College is a three-year, post-secondary training institution located in central Kenya which also trains large numbers of young men and women in the fields of general agriculture, animal husbandry, agricultural mechanics, range management, dairy technology, and home economics.

Some of the early graduates from the College have completed degree level training and will be staffing supervisory posts in the Ministry of Education as well as the Curriculum Development post in the Centre. Each year the College is producing more trained teachers and they are now teaching in about 35 regular secondary

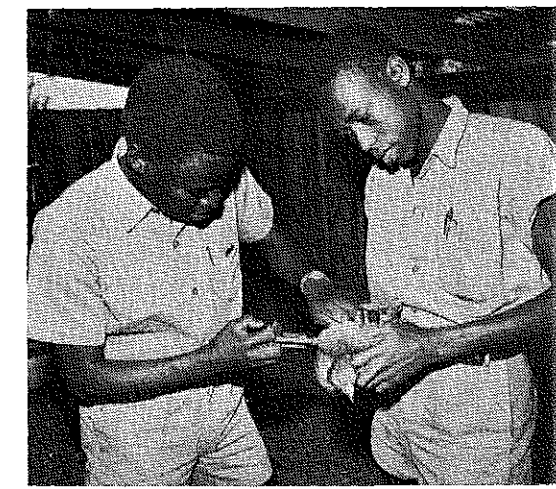
schools, all funded by the government of Kenya. By the end of 1969, all staff provided by West Virginia University were to have been replaced by this corps of local teachers.

• Conclusion

In the past many Kenyans regarded agriculture as an occupation of the unfortunate, uneducated, and unskilled. The secondary agricultural education program was designed to change this unfortunate attitude. Education officials in Kenya are making a real effort to improve the image of agriculture as an occupation and re-orient the limited guidance efforts in the secondary schools.

Agriculture is now being offered in many secondary schools, but this could hardly be classed as "vocational" agriculture. Perhaps it could more accurately be called pre-vocational or "agricultural appreciation." It is unrealistic to expect that many of the secondary graduates will return to ordinary farming, given the realities of the labor market and the rising expectations incurred in the educational process.

But agriculture as a general education subject does offer advantages—creating a more favorable attitude toward the agricultural industry, directing students toward the many jobs available in off-farm but agriculturally related areas, and bringing increased knowledge about agriculture to bear on the agricultural holdings over which many students retain control after their secondary education and migration into jobs away from their homes.



Secondary agriculture students in Kenya learn to vaccinate chickens.

FORESTRY INSTRUCTION FOR HIGH SCHOOL STUDENTS

NOLAN ALDERS, Teacher of Agriculture
Nacogdoches, Texas



Nolan Alders

It has been said that the future belongs to those who prepare for it! We in vocational agriculture have long prided ourselves in offering the best in opportunities for life preparation.

Agricultural educators have always felt that course offerings were up to date. However, we must be responsive and encourage a redirection of the present agriculture programs.

At Nacogdoches High School we are branching out to offer a comprehensive program in agriculture. In addition to a new course in forestry a cooperative-part-time agriculture program is now in its fourth year.

Planning the Program

Agriculture is the largest industry in Nacogdoches County with an annual income, excluding forestry and forestry related products, exceeding thirty-one million dollars. Since our traditional offering of vocational agriculture was enlarging to embrace cooperative part-time training in agriculture, we decided to survey our county to see if an enlargement in forestry was needed.

We found that 600 people were engaged in forestry and related production activities. Estimates were that by 1980 some 1,500 laborers would be employed. We also found that there were 10 technicians employed with 160 needed by 1980. There were 40 professional personnel with an additional 40 needed in the future.

The value of timber production to the county is currently five million

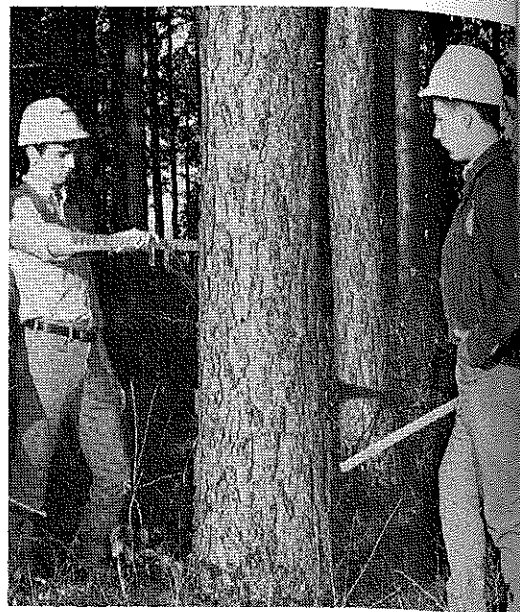
dollars annually and this figure is expected to skyrocket by 1980. At present the county has 410,000 acres of woodlands. Two new timber products plants have opened or will open this year including a wood treating plant and the International Paper Company's new five-million-dollar plywood and wood products plant.

The Program

With such over-whelming evidence of the need for forestry instruction, we developed a course in forestry production, processing, marketing, and services. The pre-employment laboratory training program is open to a limited number of juniors and seniors who enroll in four other courses and forestry. Two credits are given upon successful completion of the course. Students receive two hours of instruction daily.

The purpose of the course is to acquaint students with subject matter on the management of trees grown as a crop. Harvesting, processing, marketing and services also receive attention. The specific objectives are to assist interested students in developing an understanding of career opportunities in forestry, to assist students in developing skills and abilities in forestry through planned on-the-ground work experiences, to assist students in learning the basic use of forestry tools and mechanical equipment, and to assist students in developing a sense of safety in forestry operations.

The curriculum includes the following major units of instruction: introduction to forestry as an occupation; forestry in Texas; growth, reproduction, and identification of forest trees; forest protection, mensuration, harvesting, reforestation, marketing, pulpwood production, purchasing stump-



Students in the Pre-employment Laboratory Program in Forestry inventory growing stock and estimate board footage to be harvested.

age, marketing forest products, equipment for pulpwood production, labor and management, insurance and accounting, financing a pulpwood producer, and safety. Each unit is covered thoroughly with on-the-ground training.

Laboratory Experience

We are using a thirteen-acre forest farm near the school that vocational agriculture students have been managing since 1952.

The help received from forest industries is essential. Industry here in the area is so cooperative that the students feel a part of each industry. Our labs, besides the woods, are where the products are manufactured in the mills, since field trips are taken to wood using plants in driving distance from the school. Already, some students have job offers for summer employment in forest industries.

Each student will work during the summer in the industry. After this on-the-job training, students enter a cooperative program in which they attend school one-half of each day. After lunch students train in one of the forestry training stations. Four to five hours will be spent there under the supervision of a plant supervisor. The student will receive an average of about \$1.50 per hour for his training plus two school credits.

Changes in Supervision Require Work with Local Vocational Education Coordinators

DALE C. AEBISCHER, Supervision
Wisconsin Department of Public Instruction

Supervision of agricultural education programs must assume new dimensions in order to keep pace with the transitions in both the educational structure in which the programs operate and in the nature of the agricultural industry. With the broadening of vocational training opportunities at the secondary level, vocational agriculture now finds it necessary to make satisfactory adjustments to a variety of other vocational programs within not only the large high schools but in most of the others.

Change

The breaking away from familiar and comfortable patterns of operation is not easy. This is especially true if those patterns have been successful and have developed substantial support from the clientele served. The changes, however, are being dictated by a variety of circumstances and must be accepted. Among the circumstances bringing about change in the nature of vocational education are the following:

—Public concern for the maladjusted segments of the school population which tend to become chronic social and economic problems.

—Public demands that schools provide opportunities for young people to develop abilities and qualities which make them employable.



Dale C. Aebischer

Dale C. Aebischer is Head Supervisor, Agricultural Education, State Department of Public Instruction, Madison, Wisconsin.

—A constantly expanding technology which challenges even the most able persons.

—The constant and changing array of social, economic, and political problems which a highly efficient system of communications keeps before citizens who have difficulty in analyzing and accepting the complex world in which they live.

Demonstrated Values

Agricultural education supervisors cannot be expected to solve all the problems noted. There is much, however, in the program of vocational agriculture which has demonstrated value in enabling students to make satisfactory adjustments to the demands of present society. Among which are the activities which enable students of all abilities to achieve within their limitations, to establish personal values in relation to problems of making a living and in living in harmony with others, and to develop leadership. The retention and improvement of such basic values in vocational agriculture as emphasis on individual instruction, the project method of teaching, the relating of a student's out-of-school experience to instructional programs, the involvement of parents in the instructional process, and the emphasis on leadership training are all important.

With the constantly enlarging demands upon supervisory staffs as enrollments grow and the complexity of school operation increases, state staffs are finding increasing difficulty in providing the help and counseling for local agricultural teachers which has been traditional. At the same time, the need for such help is greater than ever.

Local Coordinators

The development of local vocational education coordinators is one means of

meeting this problem. Such a person is part of the local administrative staff with the specific responsibility of developing and supervising the local vocational education program.

Among the competencies and qualifications which a local coordinator should possess are a successful background of vocational teaching, a sound philosophy of vocational education, the capability of analyzing local needs and providing leadership in developing a total vocational program to meet such needs, a capacity to interpret and relate effectively the local vocational program to the school administration, teachers, students and the public. He will need to understand and encourage the development of all segments of the vocational program with impartiality.

In such a capacity, the local vocational coordinator can draw on state supervisors for suggestions and help in planning of local agricultural education programs, inservice teacher education, development of program standards, improvements of instructional methods and techniques, and for evaluation procedures. He is in a most favorable situation through day-to-day contact to provide essential help to a beginning teacher and others who need encouragement.

In addition, the local coordinator may assume responsibility for compiling the numerous reports associated with vocational programs and relieve the teachers of this burden. He becomes a medium to bridge the constantly widening gap between the state agricultural education supervisors and teachers. Much of what has been accomplished in vocational agriculture in the past through face-to-face contact between supervisors and teachers may need to be accomplished through local vocational education coordinators.

Occupational Education in Forestry

WALTER D. RICE
Haywood Technical Institute
Clyde, North Carolina



Walter D. Rice

Walter D. Rice is Chairman of the Division of Agricultural and Biological Education, Haywood Technical Institute, Clyde, North Carolina.

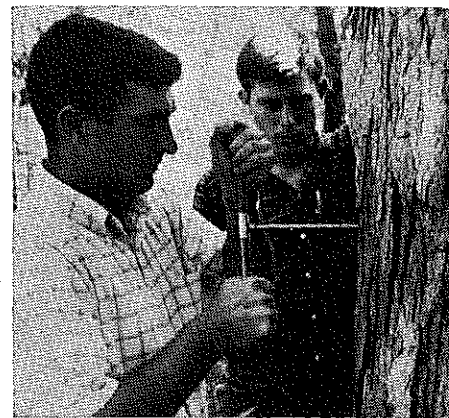
Haywood Technical Institute is one of fifty units of the North Carolina Community College System. Its location in the Great Smoky Mountains affords an unique opportunity for educational programs in occupational forestry and related fields.

Some thirty miles away is the location of the first forestry school in the United States, the Biltmore Forest School, which was founded in the late 1800's. Lands on which the students of the Biltmore Forest School practiced forestry formed the nucleus of the Pisgah National Forest and have been under forest management for over seventy-five years.

Haywood Technical Institute is proudly building upon these early traditions. The Division of Agricultural and Biological Education has organized into two departments—Forestry and Wood Products.

Forestry

The Forestry Department offered courses for the first time in September



Students in the Forest Management program at Haywood Technical Institute determine the age of a tree.

1967. The first curriculum, a twenty-one month program in Forest Management, attracted students from three states. Subsequent classes have drawn students from two additional states, as well as from a much broader area within North Carolina. Graduates of the program are successfully employed in several states throughout the South.

In June 1969, a comprehensive twenty-one month program in Fish and Wildlife Management was initiated. Students in this curriculum are involved in a program of instruction that will produce capable technicians in the field of wildlife management. Plans provide for the early establishment of a program in Forest Recreation.

Hundreds of thousands of acres of forest land and many rivers and lakes are available within easy access for field training of students in the curricula within the Forestry Department.

Wood Products

The Wood Products Department was formed in January 1969. Early activities were concentrated on the construction of a classroom building and a sawmill building and the installation of modern equipment. These buildings and equipment constitute the most complete facility for training in the sawmill trades in this country.

The facilities include both circular and band sawmills, each with an automatic carriage, an edger, a double-endtrimmer, a completely modern automatic dry-kiln, a large saw-filing laboratory with up-to-date equipment, and three large classrooms. The future will see the installation of debarking, chipping, and planing equipment.

Curricula in the Wood Products Department are ten-month programs in three areas—sawyer, saw-filer, and

lumber grader-dry-kiln operator. Instruction began in these programs in June 1969. Early graduates have enjoyed great success in securing employment within the lumber industry. Students have come from seven states and generally return to their home localities upon completion of training.

Training in Primary Wood Utilization will begin in June 1970.

Students

Students accepted into any of the programs are carefully screened. High school graduation or its equivalent is required. Effort is made to accept students who demonstrate abilities in mathematics and English. Admission requirements are less stringent for training in the sawmill trades. High school graduation is not required, but it is hoped that applicants will have achieved the tenth-grade level.

Factors for Success

Before the institution of training in any curriculum, a representative advisory committee is formed for each program. Membership includes individuals from state, federal, and private organizations. Advisory committees are relied upon for guidance in curriculum development, student recruitment and placement, and assistance in staff recruitment. Periodic meetings of these committees are conducted for the continuing evaluation and revision of the training programs.

Possibly the most important factor contributing to success is the selection and employment of proper instructional staff. Courses of a general education nature are taught by professionally-trained, experienced personnel. Courses peculiar to specific curricula are presented by instructional personnel, employed specifically for these programs.

Instruction in Forest Technology

JOSEPH G. SICK
Williamsport Area Community College
Williamsport, Pennsylvania



Joseph G. Sick

Forest Technology is a rapidly expanding two-year Associate Degree program offered at the Williamsport Area Community College, Williamsport, Pennsylvania.

Covering a broad field of subjects which comprise forest land management for multiple uses and purposes, the program emphasizes practical application of technical theories and principles as performed in private and public forestry employment and stresses field work in all aspects of instruction.

Thirty students were admitted to the program when it was begun in 1966. During the second year of operation, 60 students were admitted; and at the present time, 90 students are working for associate degrees in forest technology.

List of Courses

The two-year period of study is divided into four semesters of sixteen weeks each. The prevailing tuition rates in community colleges in Pennsylvania apply to the Forest Technology program. Students from sponsoring districts of the college pay one-third, the state one-third, and the sponsoring districts one-third. The accompanying chart indicates the courses completed during the four-semester program.

Equipment used in the program includes many different items. Familiarization and practice with the equipment is a requisite for all students through laboratory work before they use equipment in field work.

The laboratory consists of 12,000 acres of forest land and plantations near the College. We are free to implement good management practices

List of Courses — Forest Technology

First Semester	Second Semester
Intermediate Algebra	Trigonometry
English and Composition	Language and Composition
Introduction to Forestry	Forest Ecology
Dendrology	Advanced Forest Mensuration
Forest Mensuration	Forest Surveying I
Forest Botany	
Third Semester	Four Semester
Principles of Business	Forest Products
Wildlife Management	Forest Land Management
Forest Surveying II	Forest and Recreation Improvements
Equipment and Machinery	Silviculture
Timber Harvesting	Economics
Forest Protection	Elective (Sociology, English, speech, geology, or geography)

on the land. Practical laboratory training is very important in a technician program.

Student Organization

A Forest Technician Association has been established with the purposes to develop character, train for useful citizenship, foster patriotism, and develop leadership. The Association's activities are designed to develop an awareness of the importance of our nation's forest resources and to stimulate their development and use and to further public and private employment opportunities for forest technicians in forestry occupations and in related fields.

Advisory Committee

An advisory committee plays a vital role in the effectiveness of the Forest Technology program. The committee is comprised of ten men from education, business, and industry and the six teachers in the department. The committee meets twice a year and adheres to programs promoting the forestry curriculum. Because of the varied backgrounds and wide diversity

of interests by the members on the committee, all possible means of program improvement, revision and updating are accomplished. Recommendations are made in such areas as employment, curriculum, and field equipment.

High School Course

To develop the competence needed at the senior high school level for occupational entry into selected service occupations in harvesting forest products and for eventual advancement in these occupations and to develop interest in forestry careers requiring post-high school training, we also offer a forestry course to high school students at the Williamsport Area Community College. The program is designed to interest the high school student and encourage him to continue study in the field. Courses include measurement, product marketing and utilization, harvesting systems, stumpage acquisition, basic hydraulics, equipment, rigging, operation layouts, forest protection, legal aspects, human relations, financing and records, growing the forest

(Continued on page 235)

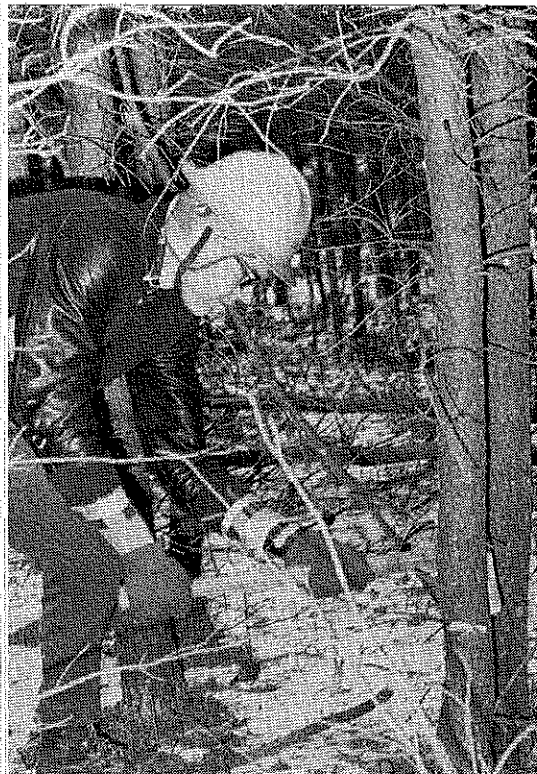
Forestry Instruction in a Natural Resource Technology Program

CHARLES WIDMARK and ELWOOD WESSMAN
Brainerd Area Vocational Technical School
Brainerd, Minnesota

The Brainerd Area Vocational Technical School (Brainerd, Minnesota) initiated a two-year post-secondary sub-professional course in Natural Resource Technology in the fall of 1968. The need for such training has long been recognized by natural resource management personnel. There is a need for trainees with a well rounded background in the natural resource field to assist professionals in adequately carrying out the desired programs.

Course of Study

An advisory committee consisting of representatives of federal, state, and



A student in the Natural Resource Technology program at the Brainerd Area Vocational Technical School uses an axe in a non-merchantable thinning for timber stand improvement.

regional conservation agencies and individuals from private industry gave direction to the formulation of the course of study for the program. Much emphasis is placed on "learning by doing" in the school's outdoor laboratory. The school has at its disposal a tract of land consisting of several thousand acres bordering the Mississippi River just adjacent to the town of Brainerd. This area provides opportunity for instruction in forestry, soils, water, and wildlife management. A high percentage of the student's time is used in field activities.

Students attend classes six hours a day, five days a week for two nine month terms. Each student is placed in a supervised work experience position for a period of ten weeks during the summer between the first and second year of training.

Students

The number of students applying to enter the program far exceeds the number of job opportunities available and therefore limitations on student enrollment are adhered to. Many of the young men entering the program seem to be generally disgusted with the previous generation's approach to natural resource management and have a true interest in the preservation and conservation of these resources. They appear to place less emphasis on the materialistic values of our economy but rather demonstrate a real interest toward the esthetic and moral levels of our society as it pertains to the management of natural resources.

Graduate are qualified as conservation aides and seek employment with federal, state, and private industry in the areas of natural resource management. In Minnesota's Department of Conservation, the graduates will seek



Charles Widmark



Elwood Wessman

employment as Conservation Aides II and will be qualified to advance to the Manager I and Manager II levels. Positions as conservation aides offer opportunities in four different options — forestry aides, park aides, fisheries aides, and wildlife aides.

Courses

Supplemental courses essential to a sound foundation in forestry include botany, ecology and silvics, surveying, mathematics, conservation, soils, mechanical skills, field observation and note writing, and verbal communication. The forestry sequence is developed in five major areas of study: inventory; cultural practices; harvest; protection; and management.

Forest inventory (cruising) is the measurements of merchantable timber, reproduction and stand growth. It is the process of determining the materials on the "merchant's shelf" so that voids, shortcomings, and strong points of the timber resource can be recognized for planning and developmental purposes. Some of the skills learned are pacing, chaining, compassing, sampling design and statistics, legal land descriptions, map making, metes and bounds layout, area calculations, aerial photograph measurements

of standing timber, point sample cruising, gathering and compilation of data, and the drawing and interpretation of curves.

Cultural practices (silviculture) is the cultural treatment of timber stands for the betterment of the forest. Such practices as the molding of timber stand density through thinnings, marking timber for harvest cuts to encourage reproduction, precommercial thinnings, brush control and weed species eradication, and seeding and planting are undertaken in the field.

Harvest (timber harvest and product measurements) involves the cutting and operating of timber and the measurements of their volume and value. Such skills and understanding of cutting, bucking, skidding, development of roads, landing locations, influence of haul distances, scaling, costs, and types of equipment used are stressed here.

Protection encompasses primarily the study of potential agents of destruction of the forest and how they can be prevented or their damage minimized. Fire prevention, presuppression and suppression, slash disposal techniques, insect and disease recognition and control as well as control of damage from the elements are studied.

Management is the final phase of study in forestry where all the information and skills are used in man-

aging timber lands. The skills, techniques and study in management include determination of volumes to be cut, sustained yield, allocation of cutting areas, species adaptability to types of management, cutting cycles, timber sales development, long term investments, compound interest and the forest enterprise, and multiple use management.

Conclusions and Comments

—It is our purpose to provide graduates who can be the liaison between the professional manager and the field crews in implementation of management programs.

—Theoretical background necessary to "get the feel" of all areas of work is vital to proper field performance.

—Practical application of all skills taught are required of each student so that he has not only read about, heard of, or seen the skill accomplished but has actually undertaken the skill.

—The size of the class is held to the number of job openings available, approximately twenty. A ratio of one student to five candidates actually interviewed has been our experience.

—The teaching of conservation philosophy is a definite part of our program, but development of employable individuals founded in techniques and job performance is our basic objective.



A student uses a tree girdler to kill undesirable hardwood trees.

—The students in the Natural Resource Technology program have a yearning for an outdoor livelihood communing with nature — a dream in which they can take an active part throughout their lives. It is our purpose to give them the tools with which they can implement this dream in a constructive effort.

Instruction in Forest Technology

(Continued from page 233)

crop, surveying, dendrology, forest recreation, wildlife management, and silviculture.

Graduates

The success of any program can be



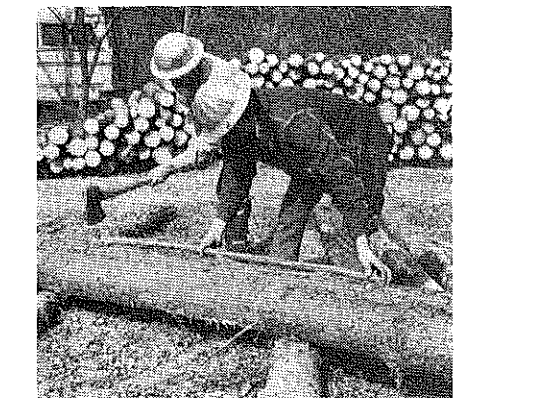
(Left) Students in the Forest Technology program at Williamsport Area Community College scale saw logs.

(Right) Forestry Technology students measuring pulpwood.

recognized in the number of positions filled by graduates in their major fields. A survey of our graduates in 1969 has revealed that all but three of the forestry students are employed in key positions in lumber industries, the De-

partment of Forest and Waters, and the Pennsylvania Game Commission.

This speaks well for the program. We gear our instruction constantly to the ever-changing needs and demands of the forest industry.



Pre-Employment Laboratory Instruction in Forest Products Harvesting

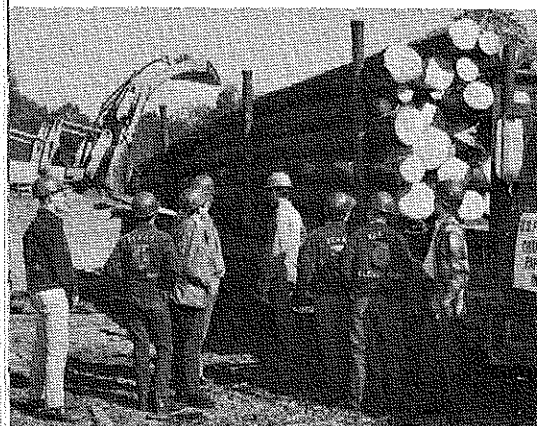
EDWIN E. SMITH, Teacher of Forestry
Cleveland High School
Cleveland, Texas

There are approximately 150,000 woodland owners in East Texas owning more than 11,500,000 acres of commercial timberland. Eighty percent of these owners hold less than one hundred acres each. The annual value of shipment from Texas' primary timber manufacturing plants is over 200 million dollars. Secondary manufacturing adds another 114 million dollars.

It has been stated that each \$1.00 from standing trees adds \$25.00 to the Texas economy through harvesting, manufacturing, construction, transportation, and marketing. This is why a Forestry Products Harvesting course has been added in some high schools in East Texas.

Pre-Employment Training

The program is designated Pre-employment Laboratory Training in Vocational Agriculture which is designed to provide technical instruction and practical experience for high school students preparing to enter em-



Students in the Forest Products Harvesting course are instructed on the long wood operation in this yard.

ployment in occupations requiring knowledge and skills in one or more of the many jobs in forestry. Students spend two hours each school day in the classroom and laboratory and earn a minimum of one and one half elective credits per year. The program also provides the advantages of belonging to the FFA.

In March 1968, representatives of the forestry industry met with Texas' Director of Agricultural Education about offering a laboratory course in forest products harvesting for high school juniors and seniors. Several schools were contacted to see if they were interested in initiating the program.

Our superintendent saw merit in the training program, and we felt that there was a need for this in our school. The program was set up in the fall of 1968 with six boys enrolled. There are seven students enrolled in 1969-70.

Course Outline

A course outline has been developed around the objectives of assisting students in developing skills and abilities in forestry through planned and supervised work experiences, developing an understanding of career opportunities in forestry, learning the basic functions of the forest industry and the basic use of forestry tools and to qualify them for employment in the woodland division of paper mills and related industries. Employment for high school graduates of this type of training includes sales and service managers, machinery operators, timber and wood procurement agents, pulpwood producers, timber cruiser, pole inspector, timber cutter, small equipment repairman, lumber grader, and research and development aide.

During the year students hear talks

on forestry as a career, visit the county courthouse to study deeds and titles, and take field trips to small sawmills, fire control demonstrations, pulpwood mills, fire tower, broom handle mill, nursery, paper mill, forestry field days, and work with marking crews and crews gathering pine cones. Some of the units covered are employment opportunities in forestry, identification and how trees grow, protection from fire, insects and disease, multiple use of forest, special forest products, labor laws concerning logging and contracts, and the changing image of the logging industry. Also included are units on measurement in forest, cutting systems, purchasing stumpage, marketing pulpwood, equipment and labor for pulpwood production, cruising timber, financing, and harvesting pulpwood.

Contributions to Industry

Harvesting forest products calls for highly trained individuals who possess abilities in business management, personnel management, and the like. The students have shown much interest in the program and the good working relations with representatives of the industry who have helped in planning and developing the program have proven to be most beneficial. The program has proven to have much value in our community. I feel that in due time we will help the labor problems in the timber industry.

An advisory committee of industry personnel and other people have helped make the program a success in our community. I feel that this program not only has helped and is helping the forestry people in the community, but has strengthened our total vocational agriculture program in the community and school system.

PREPARATORY EDUCATION FOR FORESTRY TECHNICIANS

JAMES E. MATTOX
Central Oregon Community College
Bend, Oregon

Central Oregon Community College is located in the approximate geographic center of the State, an area surrounded by intermingled stands of ponderosa pine and western juniper. To the west and south are large holdings of National Forest timberland. These lands, managed by the United States Forest Service, are used extensively as field laboratories. The nearby Cascade Mountains provide unique opportunities for studying heavy recreational use as it relates to the management of both commercial forest and wilderness areas.

Program

The courses offered in Forest Technology are designed to prepare students for many positions as they relate to the various uses of forested lands. Expanding markets for wood products and dwindling supplies of virgin timber have led to the necessity of intensively managing second growth timber. This has created an increasing demand for technically trained men to manage both the second growth timber and the remaining virgin timber. The various uses of forested lands, together with accelerated changes in uses and management techniques, necessitate a broadly based preparatory education for the forestry technician.

The program is also designed to provide an opportunity for those persons already employed in technical forestry occupations to obtain further training.

The curriculum was designed with the advice and assistance of a special advisory committee of foresters from the research, management, and marketing branches of the industry. This committee meets periodically to review the program and suggest revisions which may be needed to meet new occupational and industrial require-

ments as they develop.

Three full-time forestry instructors are assigned to the program. In addition, part-time instructors from management and industry are hired to teach specific courses. General education courses such as mathematics and English composition are taught by the regular college staff.

Courses

All courses of a technical forestry nature are designed so that the learning process will include a maximum amount of actual field experience. This field experience is obtained from weekly field trips and field laboratory exercises for each course.

Supervised on-job training is not included in the program, but all students are encouraged to work as forestry technicians during the summer between their freshman and sophomore years.

The Forestry Technology program requires satisfactory completion of 94 quarter hours of training during the two-year period. Technical training includes several courses in each of the following fields of study: tree and range plant identification; surveying and mapping; log scaling and timber cruising; range and wildlife management; forest regeneration and timber harvesting; prevention and control of forest fires and insect infestations; recreation and watershed practices; and crew management and safety. General education courses include mathematics, English, speech, technical report writing, and applied psychology.

When compared to forestry technology programs at other schools in Oregon and Washington, the program at Central Oregon Community College is somewhat different. Watershed and range management training is em-

phasized because the College serves an area which includes large acreages of grassland, as well as timberland, on the eastern side of the Cascade Mountains.

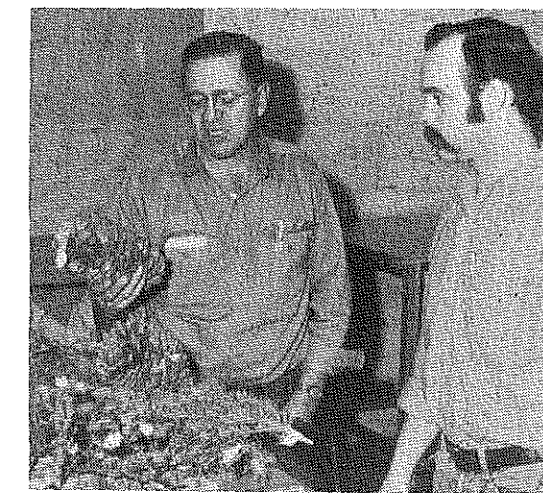
Students

Upon successful completion of the two-year program, students receive an Associate of Science degree in Forestry Technology. They are prepared for highly-skilled, technical, and semi-professional jobs.

Approximately two-thirds of the students have recently graduated from high school. Men who have completed duty with the armed forces make up most of the remaining enrollment. A few somewhat older persons are also enrolled.

Women are also encouraged to participate in the program. One or more women have been enrolled as full-time forestry technology students almost every term of the school year since the program was begun.

Graduates have found their employment quite rewarding. All have found a type of work to which they have been able to apply the training received. Promotions to responsible positions have been rapid. Graduates are primarily employed as timber cruisers, log scalers, timber sale administrators, range management technicians, thinning contract supervisors, surveying crew foremen and supervisors, and recreation specialists.



James E. Mattox (left), Assistant Professor of Forestry at Central Oregon Community College describes the characteristics of a sugar pine cone to forestry technology students.

BOOK REVIEWS

GERALD R. FULLER, Special Editor
University of Vermont

UNDERSTANDING AND MEASURING HORSEPOWER — MOTORS: ENGINES: TRACTORS, Athens, Georgia: American Association for Agricultural Engineering and Vocational Agriculture, 1969, 72 pp. \$3.00.

The terms energy, force, work, torque and power are discussed with relationship to each other and the horsepower formula is developed. Manufacturer's terms such as the maximum, net, continuous and rated brake horsepower are explained also. The torque and horsepower comparisons will enable you to understand the sales terms used today.

Part two of the book develops the technique for determining the size of electric motors, gasoline engines, or tractors in terms of size and type of load. Interpretation of the Nebraska Tractor Test is also covered.

Dynamometers are used to measure force or power. The prony-brake, water-brake, hydraulic gear pump, electric and string and spring units are illustrated. The discussion of the merits and limitations will be helpful when a dynamometer is selected for the instructional program. Testing facilities are described, tools are listed, and the proper safety equipment is recommended. Regardless of the dynamometer selected the proper operational procedure for testing of the power unit is outlined step by step.

The best testing procedure is worthless without accurate interpretation of the data and assistance is found in part four. The appendix is worth the price of the book as horsepower is determined mathematically. The derivation of the horsepower formula is explained and the elements which influence horsepower are discussed.

An abundance of excellent illustrations, the trade mark of an American

Association for Agricultural Engineering and Vocational Agriculture publication, are used in explaining the principles stressed in this book. This will be an excellent text for high school and vocational-technical students. People of all ages can more easily understand horsepower principles by consulting the publication.

Forrest Bear
University of Minnesota

★ ★ ★

YOUTH OPPORTUNITY IN AMERICA — AGRIBUSINESS by Gary Running. Minneapolis, Minnesota: Peavey Co., 1969. (Two slide sets of 80 color slides each with accompanying tapes and a teacher's guide, \$59.00.) Order from Visual Education, Inc., Suite 812, 1425 H Street N. W., Washington, D. C. 20005.

This package of materials is designed to provide teachers a resource to use in informing young people from all the farm, town, and city that promising careers are available in agribusiness.

The two slide presentations highlight the need for conscientious, highly trained young people in agribusiness. They explore career alternatives and outline educational and training requirements necessary to advance in the food and fiber industry. The resource unit, bound in an attractive vinyl three-ring notebook, contains the following elements: an "Opportunity Interest Survey" intended to arouse student interest and also serve as a guide to student awareness of agribusiness career possibilities; five lesson plans providing a comprehensive view of agribusiness including references and thought questions to stimulate stu-

dent participation; and word-for-word copies of the two slide presentations recorded on tape.

The material is best adapted to the high school level, but it can be used successfully at the post-secondary level in vocational-technical schools, junior colleges, or as part of college or university career orientation programs.

The material was developed by Peavey Company in cooperation with leading agricultural educators and successful agribusiness leaders.

Curtis D. Norenberg
University of Minnesota

★ ★ ★

LIVESTOCK HEALTH ENCYCLOPEDIA by Rudolph Seiden, edited by W. James Gough. New York, New York: Springer Publishing Company, Inc., 1968, Third Edition, 628 pp. \$11.00.

This is a concisely written compilation of information on health problems of cattle, sheep, goats, swine, horses, and mules. It is organized much as an encyclopedia or dictionary. Diseases and parasites are explained in terms of place of occurrence, cause, prevention, diagnosis, spread, and treatment. The terminology is simplified so that persons without professional veterinary training can understand the explanations. Veterinary, medical, chemical, pharmaceutical, and other scientific terms are explained and cross referenced to facilitate comprehension and reduce confusion. The content of each explanation is based on official publications and authoritative source. A lengthy bibliography is included.

The *Livestock Health Encyclopedia* is best suited as a reference book. Every teacher of agriculture who teaches in an area where livestock farming is important should find this book to be of considerable value. It is also a handy reference for cattlemen, students, and others involved with livestock. The ease of locating information about specific livestock health problems should facilitate lesson planning and reduce the amount of time required.

This book can help to bridge the communications gap that frequently exists between a profession and the public by assisting the non-veterinarian

in understanding the technical terminology of the professional veterinarian. Numerous pictures and drawings help to make the explanations more vivid. The content is very nearly applicable nationwide with the only exceptions occurring where area or statewide eradication programs may be in effect.

Jasper S. Lee
Mississippi State University

★ ★ ★

From the Book Review Editor's Desk

PROGRAMMED INSTRUCTION — BOLD NEW VENTURE by Allen D. Calvin. Bloomington, Indiana: Indiana University Press, 1969, 250 pp. \$7.50.
Eleven authors contribute their knowledge in this book. Agricultural educators interested in programmed instruction will be interested in the chapters on "The Case For and Use of Programmed Tests," "The Teacher's Role in Programmed Instruction," "Programmed Learning in Job Corps," "On Beyond Zebra: The Use of Programmed Instruction in Adult Education" and "Programmed Learning and University Instructional Services." The book contains an excellent bibliography.

LIVING POOR — A PEACE CORPS CHRONICLE by Moritz Thomsen. Seattle, Washington: University of Washington Press, 1969, 314 pp. \$6.95.
Any person interested in international education, especially in the Peace Corps, will enjoy reading this book. The description of the author's experiences is written in easy to read prose. His presentation is "sometimes horrifying, often hilarious, and always moving." Agricultural educators should review this book and determine whether it would be an appropriate addition to their school's library.

HOW TO PROTECT YOUR BUSINESS, edited by Laurence Stessin, Ira S. Wit and Elmer I. Ellentuck. New York, New York: Man and Manager, Inc., 1969, 97 pp. \$7.50.
This publication, written in an interesting style, presents questions that a businessman may face and then describes court actions. Teachers may find this book helpful in planning and teaching agribusiness courses.

RESOURCES AND MAN — A Study and Recommendations by the Committee on Resources and Man, National Academy of Sciences, National Research Council. San Francisco, California: W. H. Freeman and Co., 1969, 259 pp. Clothbound \$5.95, Paperbound \$2.95.
A compilation of excellent readings and a valuable bibliography regarding the problems man faces in reaching a lasting accommodation with the natural resources of his planet are presented in this "unsettling" book. While too technical for many high school students, the present and potential professional agricultural educator should acquaint himself with this publication.

News and Views of NVATA



JAMES WALL
Executive Secretary

Highlights of the Twenty-First Annual Convention December 6-10, 1969

—Millard Gundlach, Montfort, Wisconsin, was elected NVATA President. Mr. Gundlach was the retiring Region III Vice President.

—Francis Murphy, Madison, South Dakota, was elected to a three-year term as Vice President for Region III succeeding Mr. Gundlach.

—D. P. Whitten, Centre, Alabama, was elected to a three-year term as Vice President for Region V replacing Travis Hendren of Cleveland, North Carolina, who completed his term.

—James Wall was named by the Executive Committee to a three-year term as Executive Secretary. Mr. Wall has served as NVATA Executive Secretary since November 1958.

—Sam Stenzel, Russell, Kansas, was re-elected to a one-year term as Treasurer of NVATA.

—Total registration at NVATA Headquarters was 561, including 125 wives and guests.

—The following resolutions were adopted:

- A Program to Continue Efforts to Re-establish a Division of Agricultural Education in the U. S. Office of Education. (Calls for continued effort by the NVATA)

- Employment of Teachers of Vocational Agriculture. (Asks for twelve months employment of all vocational agriculture teachers)

- AVA and NVATA Meetings. (Asks for pre-convention meetings of NVATA and AVA Boards)

- Farm Veteran Training. (Asks for benefits to be extended to veterans entering agriculture, including farming)

- Tax Legislation. (Opposes taxing of a retired person at the salary rate

during earning rather than on the retired income tax sheltered annuities)

- Preparation of Legislation. (Requests the AVA Board and Executive Staff to prepare legislation providing for field of service identification)

- Teacher Liability (Asks AVA and NVATA to study the broadening of tort liability insurance coverage)

- National Contest Committee. (Requests FFA Board of Directors to adopt a policy of staggered terms)

- National Farm Safety. (Asks that National Farm Safety Week be changed to an early spring date)

- Convention Addresses. (Asks that NVATA consider making available tape recordings of addresses presented at the Boston Convention)

- Coordinating Legislation. (Calls for the NVATA Executive Committee to take the lead in securing unified support from the professional education organizations, farm organizations, and the industrial and agribusiness industry for NVATA resolutions.)

- NVATA Officers. (Asks that NVATA express appreciation to boards of education and administrators for the service of each national officer.)

—Special citations were presented to T. L. Faulkner, State Supervisor, Alabama; C. E. Bundy, Teacher Educator, Iowa; E. E. Clanin, Teacher Educator, Indiana; J. Mariona Adams, Associate Commissioner of Vocational Education, Arkansas; Elmer Towne, Agriculturist, Vermont; and Byrle Killian, State Supervisor, Oklahoma.

—R. M. Hendrickson, Vice President and General Manager, Agricultural Division, Charles Pfizer Company accepted the NVATA Outstanding Service and Cooperation Award for the Pfizer Company.

Stories in Pictures

ROBERT W. WALKER
University of Illinois

The annual meetings of the American Association of Teacher Educators in Agriculture were held during the AVA Convention in Boston, December 1969. Charles C. Drawbaugh (right) of Rutgers University, AATEA President for 1970, performs under the watchful eye of Paul Revere. (Photo by Robert W. Walker)



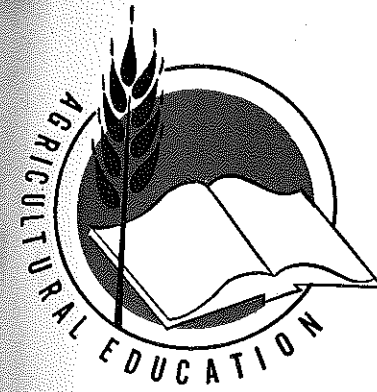
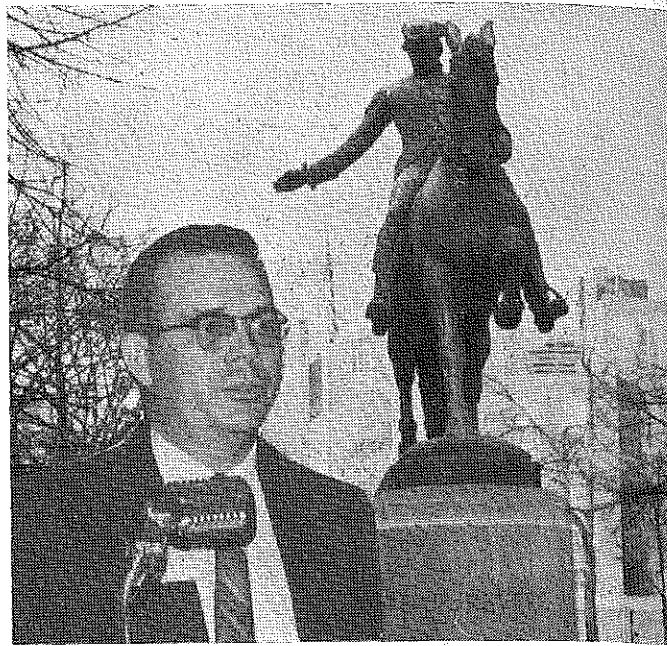
W. Howard Martin, Professor of Education at the University of Connecticut, presents the AATEA Lecture on "Agricultural Education: Image and Substance." (Photo by Robert W. Walker)



George F. Ekstrom (right), Emeritus Professor of Agricultural Education at the University of Missouri, is presented the 1969 AATEA Distinguished Service Award by George L. O'Kelley, Jr., Vice President for the Southern Region. (Photo by Robert W. Walker)



AATEA EXECUTIVE COMMITTEE: (Left to right) George L. O'Kelley, Jr., University of Georgia, Southern Region Vice President; Richard H. Wilson, The Ohio State University, Central Region Vice President; W. H. Annis, University of New Hampshire, Secretary; Charles C. Drawbaugh, Rutgers University, 1970 President; Orville E. Thompson, University of California at Davis, 1969 President; William E. Drake, Cornell University, Atlantic Region Vice President; George L. Luster, University of Kentucky, Treasurer; Irving C. Cross, Colorado State University, Pacific Region Vice President; Alfred H. Krebs, Virginia Polytechnic Institute, Past President; and Gerald R. Fuller, University of Vermont, Atlantic Region Alternate Vice President. (Photo by Robert W. Walker)



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Featuring —

INSTRUCTIONAL PROGRAMS IN AGRICULTURAL PRODUCTION