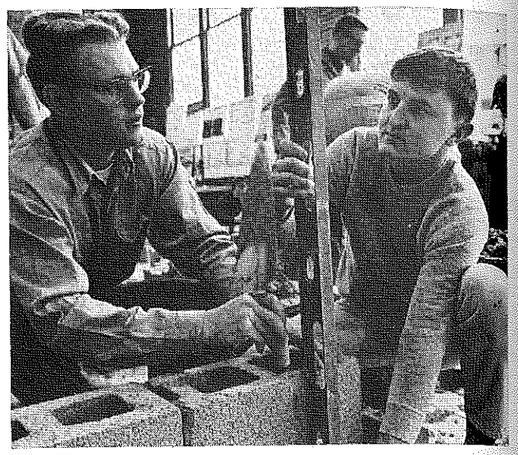
Stories in Pictures

GILBERT GUILER

Ohio State University



Concentration and care with proper tools which will result in a level end square building corner as stressed in Minnesota Agricultural Mechanics shops.

Photo by F. Bear.

Walter V. Potts, teacher of vocational agriculture at the Franklin, Tennessee High School, explains the electrical entrance switch to two of his students. They are from left: Earl Vernon and Danny Webb.

Photo by K. Mitchell.

Reminiscent of early farm days when horse-drawn wagons pulled materials or produce on the farm is this view of an old wagon wheel sitting in the sun. Weeds growing up around it attest to its retirement from active duty.

Bureau of Reclamation photo by Mel Daivs.

Agricultural . . . . . Education

Volume 39 April, 1967 Number 10

Dr. A. A. Baltensperger, Head of Department of Agronomy, New Mexico State University, discussing cotton research with Vocational Agriculture Teachers. (left to right): Ronald King, Deming, New Mexico; Delano Arnold, Elida; Stanley Lewis, Estancia, and Dr. Baltensperger.

Featuring—RESEARCH

1917.....50th ANNIVERSARY.....1967

1st National Vocational Education Act

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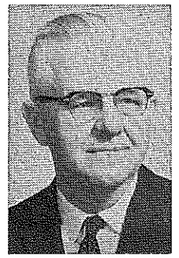
Asking the Right Questions



Cayce Scarborough

Theory & Practice

The point has been made previously in these columns that we should not expect research to solve all of our problems. There seems to be general agreement with this view, although some feel that certainly research should be able to contribute to problem solving. Let's explore this a bit further and ask what may be a prior question. Do we know how to ask the right questions? Apparently some people whose opinion might be worth careful consideration have some question about that question! Note the following:

> Your group is not basically a research-oriented group. It has been a closely-knit, tradition-bound group, as several of you have emphasized—nonetheless a good and highly productive one. But you have had little or no experience in asking research questions. So, I raise the question, "*Can* you ask the right questions?" (Lester Kellogg, Director of Economic Research, Deere & Company, speaking to the National Seminar on Agricultural Education Program Development and Research, Ohio State University, August, 1965.)

If we are not asking the right—maybe we should say the most important—questions, then our research, however sophisticated, could add relatively little. There are many factors to consider in arriving at priorities for questions to ask for research to help answer.

Is the question raised of major importance to a better educational program? Even "pure" research, in contrast to "applied," must be expected to have some relevance of importance to something or it would not be done. Certainly educational research should have some clearly defined implications for better educational programs. Since we cannot do everything, there must always be some hierarchy of values operating to determine how we spend our time in research or any other activity. These values need to be brought to the service and carefully examined in arriving at priorities. A quick, brutal test is to assume that the results of the proposed research are in, and you ask "*So, what?* A recent review of a sizable research project, carefully designed, done, and written up, raised this very question in my mind. In this case no satisfactory answer could be found. I am not suggesting that every research result should be immediately put to use in an on-going program. Rather that educational research should seek to attain help in answering some important educational questions.

Where do we find such terribly important questions? I suggest that some of these are so close to us that we have been overlooking them for years. For example, the question of how many students should be enrolled in high school classes of vocational agriculture has been under much discussion for many years. Do we know how to answer this question any better now than we did 20 years ago? I suggest that we can't "answer it" as well as we could then. How about the length of class periods for these same classes? Some supervisors have resorted to "forcing" a principal to shift his whole schedule around so that the teacher of vocational agriculture would have a certain number of minutes that someone had decided that the class *must* have. Yet we have little valid evidence that we know the optimum enrollment and length of time for the most effective classes in vocational agriculture. So, I think that a major source of questions for research might be in the area of direction-finding for needed changes for our on-going programs.

Finally, I would suggest that we try to listen to questions that other people may want to ask about agricultural education. Certainly, we must ask the sociologist, psychologist, economist and philosopher to raise questions that they see. This will come naturally, if we listen, as we devote more time and effort into research, for the simple reason that most of our researchers will be from these fields. Some in our group seem to have fear of any "outsiders." One such person when asked why said, "You can't tell where their research will come out." That's good enough reason if you have already decided that no change is needed in the current program. If this is the case with most of us in agricultural education, it will likely mean that we will never be *asking the right questions.*

Cayce Scarborough

While preparing copy for this month featuring *Research,* I was reminded of a statement made by Dean Rupert Evans, University of Illinois, while discussing some of the reasons that people in vocational education did not do more and better research. He said that we were more nearly *missionaries* than researchers, implying that we had more practice telling our story than in research. The quotation in the editorial at the left holds a similar implication. May be that some of us are just not research-oriented.

What does a teacher expect of a supervisor? Probably varies a great deal. But if expectations vary too much, how can a supervisor be effective? A $1 bill will be sent to the two teachers sending in the best letters on "What I Expect From My Supervisor." (I realize that you teachers don't need the $1 but I need your letters for the June theme on Supervision. But, as they say on TV, you must hurry!

I goofed. In this column in January I stated that a state supervisor's office sent out a list of 25 important items for teachers to do in a month and that 21 of these items were FFA activities. I had my figures right but the time wrong. The supervisor set me straight and gave me permission to use his letter. See Letters to the Editor. Any reaction to the reaction?

For some readers I also overdid the light touch in January, as Willis Luedke very nicely told me in his Letter to the Editor. Although it would not be possible to please everybody, letters from close readers help greatly in editing the magazine. THANKS!

Still another reaction can be seen in the Letter to the Editor from Alton Ice. As indicated earlier in this column, Alton was requested to further clarify the *AV Journal* policy on publishing articles. What is your reaction to this reaction?

(*Continued next page*)

Letters to the Editor

Dear Cayce:

In the November, 1966 issue of the AGRICULTURAL EDUCATION MAGAZINE your editorial entitled "Change? Who? Me?" was most provocative and no doubt disturbed our established routine. We need this quite frequently.

In the editorial you made reference to an AVA policy that prohibits the A V JOURNAL carrying an article on new programs in vocational agriculture involving sales and services, without prior approval by someone from distributive education.

There is a procedure in the AVA policies for the JOURNAL Editorial Board to resolve controversies between two or more divisional editors. If a controversy is not resolved by the Editorial Board, the final decision must rest with the AVA Board of Directors. The article to which you apparently refer in your editorial was considered by members of the JOURNAL Editorial Board and an acceptable solution was not reached, so the matter was referred to the AVA Board of Directors. During their July, 1966 meeting their action was to not publish the article at this time. The Board asked the Agriculture-Distributive Education Joint Committee to expedite the development of guidelines. The committee met during September, 1966, and the guidelines developed were approved by both divisions and the AVA Board of Directors during the meetings in December, 1966.

The AMERICAN VOCATIONAL JOURNAL Editorial Board will no doubt review the article in question and others in view of the approved guidelines.

The policies and actions of the AVA Board of Directors is not to thwart change and progress in vocational education but to make every effort to bring these about in an atmosphere of understanding. Perhaps the wide dissemination and discussion of the guidelines will contribute to this atmosphere of understanding, cooperation, and enthusiasm for quality vocational education for all citizens.

Sincerely,
Alton D. Ice, Director
Professional Services
American Vocational Association

Theory & Practice

It might be possible that researchers in vocational education are overlooking a major factor in identifying factors influencing occupational choice and related decisions. That is, the *personal* factor. Such decisions reflect values held by the person. Some research in other fields indicate clearly that some people make decisions on a personal basis more than for profit or some other "objective" basis. Some sociologists are interested in this field, knowing that the vocational educator must be concerned about factors other than skill in doing the job.

Speaking of research, did you see the report of the entomologists who use caged female insects to trap swarms of male insects, thus greatly reducing the population? They say that it may beat pesticides. Guess that's a case of using nature to counteract nature!

Thanks again for your communications. See you next month.

Cayce Scarborough

The list of 25 items referred to in the December issue of the Agricultural Education magazine were not "for a given month." The list contained items scheduled for the months of September through June.

We enjoy reading many of the articles published but we cannot see the separation of parts of a whole that are integral.

Sincerely,
Ralph A. Guthrie, Chief
Agriculture Occupations

Thanks Ralph, sorry that I got the time period wrong. However, I did not evaluate the 25 and 21, I thought that the listing of recommended activities was interesting enough to give broader coverage than your state newsletter might have. I have no basis for knowing whether this is "good" or "bad" for programs in Illinois, that's why I did not identify the state. Your letter clarified several matters. THANKS!—CCS

Dear Mr. Scarborough:

I was very happy to receive my January copy of the AGRICULTURAL EDUCATION MAGAZINE with the many informative articles on graduate study. I feel the magazine has constantly been a great help to agriculture educators in both the secondary and college levels of teaching. This month's issue will probably be a guiding light to many students of agriculture education in helping them to work out masters degree programs.

I feel that a magazine which represents a professional group such as ours is not a place for the "playboy" type of advertisement located on page 152 in the January issue. If we are to keep the prestige that this magazine holds then I personally feel that a picture in an advertisement of this type has no place in our own professional magazine.

I would like to compliment you for the fine editorials that you have been writing over the past year.

Sincerely,
Willis D. Luedke, Past President
Nebraska Voc. Ag. Association
Crete, Nebraska

All three paragraphs are appreciated. Such letters are very helpful in planning future issues. THANKS!—CCS

Dear Cayce

Sometimes, we in Illinois, read the Agricultural Education magazine. Sometimes we find some interesting items tucked away in various places—like the one in the December, 1966 issue attached to the "sheet" to which it referred.

May we remind you that FFA is "an integral part of vocational agriculture." That fact is established by law. We, in Illinois, believe that FFA and vocational agriculture cannot be separated. In fact, many departments have survived only because of their FFA activities.

Guest Editorial —

Improving Education With Action Research

PHILIP L. EDGECOMB
Teacher Education
University of Massachusetts

Philip L. Edgecomb

Leaders in all fields are continually evaluating new ideas and innovations for possible application to their situations. Vocational agriculture teachers have actively participated in research projects longer than most other groups of teachers. However, participation in pilot and dissemination projects in technical agriculture have been more common than involvement in experimental educational research. We have accepted the value of research in technical agriculture because we have had experience with it for a longer period of time. Educational research is still in its infancy, and teachers have shown less confidence in the possibilities of educational research; this may also be true of some teacher educators and supervisors in agricultural education. Yet, we agree that more facts are needed for the sound solution of educational problems. Educational research can provide the tools and methods for these fact finding expeditions; it can be used to evaluate all aspects of a prospective innovation instead of just the highlights that we may tend to remember. Reliance on these facts from controlled observations can provide a sounder base for present and future educational decision making. Agricultural educators have a tremendous asset in their knowledge and appreciation of agricultural research, which can be used as a stepping stone to the improvement and use of educational research.

The opportunities for the immediate application of educational research are all around us. Research can and is being used to evaluate present educational practices; we do not have to wait years for a practical application. Materials developed for recent research projects are being used in the classroom; leading teachers are adapting them to their local situations. Many opportunities for more diverse course offerings have been discovered and supported by recent occupational studies. Some of our past course offerings have been questioned and changed as a result of educational research. Research is and will continue to assist us in educational decision making.

The modern public school system needs continuing research in each school. Research must be extended beyond the colleges and universities to the place of practical application as we have done in technical agriculture. More research needs to be initiated at the local level with the help of research coordinators in the local schools. Industry is already challenging educational institutions concerning their ability to educate all youth; they have pointed to the lack of a systems approach to education. Other challenges are arising from the armed forces, labor, and anti-poverty groups. The challenges will become greater unless all educators accept the challenges and responsibilities of the future by utilizing research in educational decision making. The dust storms of the 1930's prompted the formation of the Soil Conservation Service and research directed toward the conservation of our natural resources. The unrest of the 1960's is focusing attention to educational research directed toward more realistic and efficient educational practices.

Book Reviews

AUSTIN, CHARLES F., *"Management's Self-Inflicted Wounds, A Formula for Executive Self-Analysis,"* 383 Madison Avenue, New York, New York 10017: Holt, Rinehart and Winston, Inc. Pages xvi plus 320. Price $7.95.

The purpose of this book is to give the reader an opportunity to examine himself as a boss, first by looking at the behavior of other bosses and then determining whether he himself is guilty of the same type of undesirable boss behavior. The preface indicates that the book is unique in its devotion to identifying the wrong way of doing things, and thus it examines the self-inflicted wounds. Following the identification of wrong ways of doing things, the author attempts to indicate the right things to do. Seventy-six self-inflicted wounds are examined in the text and prescriptions to aid in healing each of the wounds are suggested.

The book should be read by all vocational educators who are in administrative or supervisory roles and it should also be carefully studied by students in the upper grades of the high school, in vocational technical post-high school programs, as well as those in university-level training situations. Readers at all levels should find many thought-provoking suggestions throughout the text.

Raymond M. Clark
Michigan State University

UNITED STATES DEPARTMENT OF AGRICULTURE, *"Protecting our Food Supply,"* The Yearbook of Agriculture. Washington, D.C.: Superintendent of Documents, 20402. 1966.

The 1966 Yearbook of Agriculture deals primarily with tools of protection of the food supply against diseases, insects, rodents, and other pests. Included are chapters dealing with methods of controlling insects, Nematodes, livestock health, safeguarding the milk supply, and many others. Teachers of vocational agriculture will find a great deal of material in the book which will be useful in their classes. Of course, it will be necessary to select sections of the book due to the fact that content is planned to cover all of the kinds of agriculture throughout the United States.

Raymond Clark
Michigan State University

Robert E. Taylor

Priorities in Research

ROBERT E. TAYLOR, Director, Center for Leadership Development
in Vocational and Technical Education,
Ohio State University *

Perhaps the most fruitful areas for research might be some of our own *unexamined assumptions,* the historical accidents, the folklore of our profession that has been handed down from generation to generation, where we repeat and transmit what we heard or what we have successfully experienced. How many of our present sacred cows have any real research or theoretical base? (Is pragmatic test enough?)

I would like to suggest the following areas for your consideration:

1. Most of you here are state staff personnel, responsible for some dimension of state leadership in agricultural education. Perhaps this is the area that has had the least attention in our research effort. What is our role in introducing planned change? In developing and testing curriculum innovations? In providing for pilot and demonstration programs? In improving instruction? How can we most effectively fullfill our responsibilities as change agents?

2. What is the possible application of the "systems approach" to state program development? How do we establish long-range objectives for state and local programs? How do we establish priorities and achieve equitable balance in educational programs between individual needs and the needs of society?

3. How valid are some of our present "requirements" in agricultural education: Six-months practice? Double periods? Twelve-months employment for teachers? What are the other alternatives? What are the comparative results in terms of educational and economic efficiencies?

4. What are some of the alternatives in providing occupational experience? What kind? When? How much? In what setting? What are the implications of controlled similation experiences versus the real thing? The school laboratory setting versus the farm or ag-business setting?

5. What is the most advantageous means of exploiting the applications of new developments in media and educational technology? What *learning* and *program efficiencies* may or may not be inherent in these applications?

6. What procedures and techniques provide a means of more effectively utilizing outside experts and resource personnel in new and developing programs? What patterns most effectively incorporate the strengths of several vocational services into an occupational program?

7. How can we realistically individualize our instruction, providing real challenge and accelerated growth for the academically talented and also for meeting the needs of the disadvantaged?

8. Can we successfully adapt or develop and utilize theoretical bases for our research and development efforts? Can we successfully test the applications of theory from other fields, thereby enabling us to draw upon the accumulated evidence of these theories? Must we evolve our "own" theories?

9. How can we most effectively evaluate agricultural education? Local programs? State programs of supervision, teacher education, research and development? How can we best establish objectives for evaluation? What are the relative advantages of program or occupational objectives versus educational objectives, stated in terms of changed behavior? What should be the major dimensions of evaluation (e.g., student outcomes, needs of society, the efficiencies and efficacies of the establishment in carrying out societal goals and meeting individual needs)?

10. What are the generalizable vocational competencies, understandings, and skills? Is there a common core to vocational education? To agricultural education?

11. What modifications and adjustments may need to be made in our instructional programs to maximize the trainee's ability to transfer his earlier training experiences? What understandings and developments are needed to effectively cope with problems of basic education as they relate to vocational education? How do we successfully integrate occupational training and general education training, particularly for adults?

12. What additional studies are needed to improve our offerings in adult education? What new insights might be gleaned in terms of their motivating factors for continued education? How can we best individualize instructional offerings in this area?

13. What additional insights are needed concerning the aspiration levels of youths as they affect career choice? Selection of training programs? Etc.? How can we inject more realism into these decisions? What is the optimal role of special groups: Vocational teachers, counselors, parents, and others?

14. How can we learn more about the mobility and migration patterns of workers in agricultural education? What are the implications for local curriculum development when substantial numbers of students migrate to occupations outside the community? How can we train students "here" for jobs "there"?

15. What are the bona fide entry opportunities which require knowledge and skills in agriculture? How may we develop additional expertise in identifying and projecting these?

16. How may we learn more about working with the disadvantaged?

17. What are identifiable subgroups with special needs? How do these needs vary? What are the implications for program development?

18. How may we optimize the role of industry and other employer groups in making them full-fledged partners in vocational and technical education?

The foregoing have been but a few potential research priorities. In one sense of the word, our research priorities should be determined by the problems we encounter in moving agricultural education in pre-determined directions. Hopefully, it will be viewed and used as an effective working tool. Optimistically, our research and development efforts will be broadened and extended through greater involvement and more effective planning and execution. The increased numbers of state research coordination units and the assistance available through centers should provide a means of assisting state staffs in meeting the challenges inherent in this area.

* Condensed by Texton R. Miller from the address prepared for the Southern Regional Research Conference, Raleigh, North Carolina, July 28, 1966.

V. R. Cardozier

Research: What Is It?

V. R. CARDOZIER, Teacher Education
University of Maryland*

One of the most striking things about scientific inquiry is its age . . . it is an infant. Research in the natural sciences is still maturing while research in the social sciences is little more than nascent . . . indeed, some would say that it is between conception and birth.

From the days of Aristotle, Plato and Socrates, some three and four centuries B.C., until very recent times, what was to become the method of science was a mental process only. Sophistry and syllogisms served for logic and experimentation. Aristotle and his students reasoned at length attempting to determine the number of teeth in the mouth of woman, apparently without it ever occurring to them that to examine a woman's mouth might answer the question.

In the early 17th century Galileo began studying the stars and making speculations about the movement of the sun about the earth, for which he was later forced to recant and denounce his own discoveries, not only by the church but by the leaders of the university.

Charles Darwin, as recently as the middle of the last century, was castigated for his challenge to prior knowledge because he presented research evidence that suggested new truths.

Thus, in terms of the age of man and his experience, scientific inquiry is indeed young.

What do we mean by "scientific research?" Ask a layman and you will likely find out that it has something to do with laboratories, test tubes, bunsen burners, calipers, and the like. He sees it as the mechanical tools of research. Yet, we know this is not the essence of research, that it is essentially a mental process, and that the tools are but the necessities for testing the mental processes. You may have read an article last year in a national news magazine about the Institute for Advanced Study at Princeton where the physicists actually have no laboratories at all . . . their research is purely of a mental nature.[1]

Many philosophers of research would insist that today we have too much of the physical tools of research and too little of the mental tools of research, or more correctly, too little use of those tools.

Scientific research is essentially the subjection of problems to inductive and deductive reasoning. We encounter a problem or a situation for which we do not have an answer and try to bring to bear as much information about it as possible. This may involve mental recall of facts which bear on it; it may mean drawing upon information already accumulated by others (this usually is found in scholarly journals and books), or we may have to collect some information, i.e., ask a few people, make a survey, or collect a sample and analyze it. This is induction. It may solve the problem, or if it is not a general problem, answer the question. Or it may not solve it at all, yet the nature of the situation may preclude the next step in research and force the researcher to stop at that point. Although his inductive research has not adequately answered the question, he must accept what is obviously a tentative conclusion as *the* conclusion. For example, Stuart Chapin pointed out, with respect to research on suicides and their causes, that one cannot very well set up a controlled experiment to test hypotheses about the causes of suicides.

While much research must stop with induction, most good research involves deduction . . . the testing of hypotheses that have grown out of the inductive process. The testing of hypotheses often involves setting up a controlled experiment in which a single or selected variables are manipulated, as in the case of matched pairs experiments or a controlled experiment in which the criterion is defined on a performance basis rather than a comparative basis. In the first case, we may want to know whether teaching method A results in greater learning than method B. In the second, we may define the criterion of success, such as the trajectory and speed of a moon shot, and then fire a rocket at Cape Kennedy to determine whether the inductively arrived at conclusions are verified by performance. Another example of the latter is Columbus' voyage to the western hemisphere. He hypothesized that the world was round and that by sailing westward he would eventually circle the globe. He has impeded in proving his hypothesis by the discovery of the western hemisphere which, incidentally, is an illustration of one of the values of basic research.

Scientific inquiry, it has been suggested, is simply a way of reasoning, which includes the collection of facts that empirically demonstrate the truth or falsity of a hypothesis. I would judge that one of our major shortcomings in research, regardless of the discipline, is the inclination to be doing things, rather than thinking. If we thought more and did fewer things we might find that our research findings were more valid. If more of our research were founded in sound theory, the quality of our research would doubtless be improved measurably.

All of us can support the idea of grounding each study in a well-constructed theoretical framework, but examination of research reports in agricultural education show little evidence of it. This is not to suggest that all research reports which do not detail the theoretical framework mean that the researcher did not base his study on sound theory.

ATTITUDES TOWARD RESEARCH

Let's look at some of the attitudes of laymen toward research.

Van Dalen[2] identifies six prevelant views toward research that are reflected in differing courses of action.

First, *repressing research.* The status quo is comfortable; we fear the unknown. I have mentioned the persecution of Galileo and Darwin for allowing research findings to lead them to positions that threatened the security of the power structure, including scholars.

Ridiculing research. Perhaps this might be called ridiculing researchers. How many people see the scientist as a fuzzy minded theorist, removed from reality, and unable to make any practical contributions to society . . . in short, a target of mirth. This even extends to researchers. It is no secret that some

(*Continued*)

* A condensation of a paper presented at the Southern Regional Research Conference in Agricultural Education, North Carolina State University, July 27, 1966.

Research: What Is It?

researchers in the biological and physical sciences view the behavioral scientist as a busybody in trivia . . . researching the obvious or inevitable.

Worshiping research. Some people, "standing in absolute awe of science, . . . accept all research reports as revolutionary, reliable solutions to problems. The glib phrase, "research shows," from the radio and TV pitchman is evidence of public worship of research . . . at least in the view of some fairly competent market research people.

Assuming superior attitude. . . . Good old American know-how. How many Americans were shocked beyond belief when the Russians put the first rocket into space? Many had just assumed that scientific knowledge and technical know-how were, if not the sole province of the U.S., at least more liberally distributed among Americans than among scientists of any other nation.

Accepting applied but not pure research. We worship research that leads to a polio vaccine, television set or hearing aid. Many contribute to research on cancer but if asked for funds to study the nature of cellular development, their response changes.

Accepting natural but not social science research. Many laymen are willing to accept the findings of research in the biological and physical sciences since they know little or nothing in those fields and are unable to evaluate the competence of the scientists, but because the social scientist uses words, most of which the layman understands, he tends to discount social science research. This, by the way, probably accounts for the fact that psychologists, economists and more lately sociologists have developed jargons which are peculiar to their disciplines and which few laymen can understand.

Seeking understanding of research. This final note on attitudes toward research can end on a positive note. We need to recognize that there is a growing number among the population that genuinely strives to understand research and its role in society. This is being helped by a number of changes. For example, you may recall that during the McCarthy period, a prominent scientist in testifying concerning his associations with communists during the 30's, stated that he rarely read newspapers or magazines during that period, that he was not well informed on world affairs then. Contrast with this the results of a recent study[3] consisting of interviews with 100 scientists which showed that today's scientists are by no means of that type. An overwhelming majority read newspapers and news magazines regularly and were well informed about social and political questions nationally and internationally.

I will consider together, under research bias, problems of several types but all of which reflect negatively upon scientific research and researchers.

The first is fakery . . . very simply, the publication of research findings which the researcher knows to be spurious, conclusions which he knows or suspects to be invalid, the withholding of limitations of his findings, and other unethical acts. Every profession has its charlatans, and research is no exception. However, it is probably sound to assume that very few of those who became researchers in the past were guilty of conscious distortion in their research.

The recent—at least recent for the social sciences—fountain of funds for research has brought rushing to educational and other social science research large numbers of individuals who are perhaps better trained in terms of technical competence but who have not been indoctrinated with the same professional standards and ethics of those of the past.

One of the most frequently heard criticisms of educational researchers and others in the applied social sciences is that their research is designed simply to confirm their biases. Just how common it is for researchers knowingly to bias their research to produce findings that confirm their prior convictions is impossible to determine. No doubt some of it occurs. But I am inclined to believe that more often the confirmation is a result of sound prior thinking, that is, the kind of mental activity that arrives at the solution mentally, leaving the experimentation only to confirm or refute the reasoning that went into it.

Related to this problem is the broader question: Can the social sciences be value free? J. A. Passmore,[4] concluded that while difficult, it can be done. He acknowledged that social scientists all have views about questions in their fields of research; this was what led them to social sciences initially. He points out that the key is to distinguish between those questions which research can solve and those which research cannot solve.

There are three kinds of problems in the social sciences, he says: *theoretical problems, technical problems,* and *policy problems.* The first two can be solved through research. We can find out whether certain phenomena are true in a society or culture; we can determine whether certain procedure or technique will produce a hypothesized result. But research cannot tell us what we ought to do. Too often the researcher is asked to conduct research to find out what ought to be done concerning a certain problem. But research cannot do this, for such a decision must involve a value judgment that research cannot make.

Research in economics can show us that it may be cheaper for a farmer to own and use certain farm machinery with his neighbors. Economically the research is valid; but it doesn't take into account that some farmers may not be able to get along with their neighbors, that harvest time is too short for both to use the same machines, or that the farmer is opposed to shared ownership on religious grounds. The technical question can be solved by research; decisions to use them must then be based on value judgments.

Passmore concludes that the social scientist, even though he has personal convictions about social questions, can be effective but only as long as he abstains from becoming an advocate of a policy. The social scientist who becomes an advocate of a policy then damages his effectiveness as a researcher of that question and in that field.

This concept poses real problems for educational researchers. We know that changes in educational practice are most likely to occur when the schools that are to make the changes are involved in testing the practices. This concept is being translated into the regional research and demonstration laboratories currently being established about the country by the U.S. Office of Education. On the one hand, there is promise of seeing change occur rapidly because of the involvement of the schools in the work of these laboratories. Yet, the staff in these programs will likely, because of the nature of their professional activity, be drawn to conclusions that relate to policy and practice which may or may not be based on sound research. In terms of establishing demonstrations and bringing about change in school practice, I suspect that the laboratories will be

"The technical questions can be solved by research; the decision to use them must be based on value judgments."

"Teachers, supervisors, and teacher educators have important roles to play in research."

effective, but I question their usefulness in research, i.e. research that is unbound by social advocacy.

Another bias that may affect a researcher's work is *design and measurement.* I will not dwell on design, except to mention some of the obvious biases. Sampling, both method and size, provides many opportunities for error. Design, and particularly adequacy of replications is another area where error creeps into much research. In educational research, lack of control is a serious source of error. For example, suppose you have eight pairs of randomly assigned schools testing two methods of teaching. You have defined the methods well and instructed the teachers to follow them. How certain can you be that the teachers are following these exactly as you have instructed them? We have a good deal of evidence that most teachers teach about the same way most of the time, unless they are under observation.

Many of the sociometric and psychometric scales and measuring devices we use in educational research are of questionable validity. We can test statistically a scale's reliability. We can perform intricate tests of its construct validity and internal consistency, but in the end these still do not assure us that the scale actually measures what we say it measures. Because this is usually so difficult, and often virtually impossible, we do the best job of refining it that we can and then hope that it has external validity. In this respect the physical and biological sciences have a great advantage and much easier task. The social sciences, and particularly the behavioral sciences, have a long way to go in achieving adequate measurement and quantification of data.

Analytical Bias and Statistics

The last cause of bias that I want to mention is analytical bias. Bias may not be the proper word . . . perhaps source of error would be better.

After we have the data collected, we are faced with the key question: What does it say? Many of the problems in finding meaning in social science data are apparent. For some data, we can, fortunately, rely on statistical tools to give us answers which cannot be gained through the "inter-ocular" process (that means it hits you right between the eyes.) In recent years we have increasingly learned how to use the tools of statistics to draw conclusions that we could not have drawn in an earlier time. The increasing use of statistics constitutes one of the major developments in the growing sophistication and quality of educational research. But at the same time, we should recognize that we are tied to R. A. Fisher's mathematical model, designed for biological research, which has been adapted by psychologists, for the most part, to research in education . . . still based on a mathematical model of biological variation. Many researchers in education have recognized this limitation and have begun working toward adaptations that are more consonant with the nature of research data in education.

Lest I be misunderstood about statistics, I can assure you that in spite of the shortcomings of our present expertise with statistics, it still helps us to do a more effective job than the inter-ocular approach, alone. While some researchers have tended to place blind faith in statistics, in my judgment, too many in education have underrated its value, and indeed ridiculed the statistical approach to the study of educational problems. In many cases, those in the latter group were not very well trained in statistics, which may account, at least in part, for their views on the matter.

BASIC AND APPLIED RESEARCH

The practical man is inclined to discount basic research as undirected, if not ill-directed, and of questionable merit. Then, we remember that Dr. Selman Waksman accidentally discovered streptomycin at Rutgers while engaged in basic research on molds. Dozens of other useful discoveries of great value have come about in a similar manner. So, most of us probably feel that basic research is worth the investment, in spite of its apparent inefficiency.

I submit that there is no basic research, *per se,* in education. Education *is,* by definition, an applied discipline, and research relating directly to educational problems is applied research. It is true that problems in education are often solved through basic research but when that is true the research is by basic behavioral scientists or deals with their disciplines. Most basic research relating to education is actually psychological research; some is sociological; some is anthropological, and a little is in the biological sciences. As I see it, the argument that plagues natural scientists and others in the basic disciplines concerning applied vs. basic research should not concern educational researchers. All of our research is applied. Although some of it may contribute knowledge to one of the basic social sciences, it generates from applied problems and is designed with their solutions in mind.

The Researcher in Agricultural Education

Typically, a researcher in agricultural education has been a practitioner . . . with the orientation of practitioners and for whom research was a sideline, conducted in spare time on problems that happened to interest him. From the beginning, his thinking and action have been cued to the practical and with a view to changes that might be made as a result of research findings.

His research has been enriched by his experience as a practitioner but at the same time that experience has often prevented his seeing beyond certain limits. Subconsciously, his experience told him that a certain line of reasoning was false, or that another solution would surely lead to success. His experience led him subconsciously (or even consciously) to solutions or courses of action that were consistent with his own experience as a practitioner.

We have lately begun to develop a corps of researchers in agricultural education and vocational education who lack much of the experience of practitioners. I think we can hope for more productive research from them. They will be hampered, it is true, by lack of experience as they plan and conduct research. But at the same time, they will lack answers which experience can provide that will free them to seek answers that some of us as practitioners would find difficult.

I suspect practitioners should begin to condition themselves to the idea that many researchers in agricultural education in the future will have had no experience as classroom teachers. I am aware that the thought shocks some people but this will occur. We already have researchers in vocational education who are trained in the basic social science disciplines and who have had no formal experience in vocational education.

(*Continued*)

"Many researchers in AgEd in the future will have had no experience as classroom teachers."

Research: What Is It?

Most agricultural educators are practitioners, but research is increasingly becoming a part of our role. Due to the increase of available funds, many of us can now conduct *bona fide* research if we wish and are competent to do so. Hopefully, many of us can and will do so for if we are to make progress, research will have to be a part of the plan. I confess to blind faith in the value of research, in spite of its apparent inefficiencies.

Some astute observers of the stock market tell me that one criterion of future success of a company and the value of its stock is the investment it makes in research. The higher the ratio of investment in research, the more likely it is to succeed. Success tomorrow will be based on what is not known today. I would wager that this might well apply to agricultural education. For many years we conducted a program that was tied to the Smith-Hughes Act and several other absolutes . . . truths that were not to be questioned, much less researched. We got into serious trouble. We have been bailed out, temporarily, by the 1963 Vocational Education Act. But it that Act simply becomes the basis for new dogma, and we do not seek new answers in the future, we will in a few years be in the same kind of trouble again.

Policy Important

Part of the question lies with policy makers. State directors of vocational education probably more than any other group will determine what happens in agricultural education research in the future. Those who look to research as opportunity and encourage researchers to generate and test new ideas will continually lead their states toward better programs and hope and optimism among all. But those state directors who are more concerned with hewing to the line, with worrying more about the details of the 1963 Act than the needs of young people (and adults too), who are fearful of the untried and unknown, will gradually lead their states into a static situation in which despair is the norm among its teachers, supervisors, researchers, and teacher educators.

Policy makers can set the stage for research, they can provide funds and encourage innovation and change, they can establish research staffs in state departments of education and the universities, but what happens after that depends upon the rest of us. We must not forget that there can be just as much intransigence among teachers, supervisors, and teacher educators as among state directors.

Teachers, supervisors and teacher educators have important roles to play in research. These roles differ from that of the research specialist, although the roles are not mutually exclusive. One of the real needs is to define clearly the research role of the practitioner in agricultural education. What is his relationship to the researcher? To what extent should he perform research himself? How do the roles of all fit together to blend into an organized effort toward continuous improvement?

Citations

1. "Education" *Time*, July 8, 1966, p. 70.
2. Van Dalen, Deobold B. *Understanding Educational Research*. New York: McGraw-Hill, 1962, pp. 2-4.
3. Burch, George E. *Of Research People*. New York: McGraw-Hill, 1965.
4. Passmore, A. J. "Can the Social Sciences by Value Free," in Feigel, Herbert and Brodbeck, May (eds.) *Readings in the Philosophy of Science*. New York: Appleton-Century-Crofts, Inc., 1953, pp. 674-676.

Themes for the Agricultural Education Magazine

July - December, 1967

JULY–
THE NEXT 50 YEARS
(1917–1967–2017)

AUGUST–
OUR PROFESSIONAL ORGANIZATIONS
(Ag Division AVA, AATFA, NASAE, NVATA)

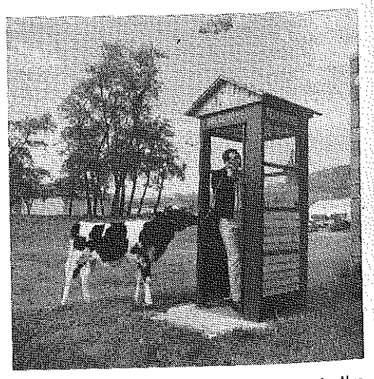
SEPTEMBER–
TEACHING EFFECTIVELY
(High School, Post Secondary, Adults)

OCTOBER–
INNOVATIVE PROGRAMS
(Local Vo Ag. Cooperative programs)

NOVEMBER–
OCCUPATIONAL EXPERIENCE
(All areas of Agricultural Education)

DECEMBER–
TEACHER PREPARATION AND CERTIFICATION
(Requirements by states, B.S., M.S.; trends)

Walter V. Potts, teacher of vocational agriculture at the Franklin, Tennessee High School (center), gives instructions to two of his students in oxygen-acetylene welding. They are from left: Myers Pugh and Bobby Adair.



"Mom, I won't be home this weekend, I've found a friend here."

Teacher Role in Research — Employment Opportunities and Competencies Needed in Farm Occupations

James T. West

JAMES T. WEST, Teacher of Agriculture, Dixon, Kentucky

Agricultural Education is in the process of upgrading and modernizing its program. Much of this progress has been brought about by the passage of the 1963 Vocational Education Act. A large part of the funds from this act has been channeled into research.

It is assumed that I, as many teachers of agriculture, have been rather skeptical of some of the research projects. I felt this might be busy work. During the several years I have been teaching agriculture, there have been many individuals researching this or reporting on that; and I had not allocated sufficient time to thoroughly investigate the data.

In November 1966, I received a letter from Mr. C. O. Neel, Vocational Agriculture Supervisor, Kentucky Department of Education and, later, a supervisory visit from Mr. Charles Wade, Area Vocational Agriculture Supervisor. They requested that I attend a meeting with one teacher from each county in the district to discuss an on-farm research study in the West Kentucky district. Frankly, I was not overjoyed at the prospect of working on a research project. However, I went to the meeting expecting to cooperate to the best of my ability.

The Proposal

After hearing the details, I developed more respect for the proposal. The research would be concerned with farmers and their opinions. I was to interview 10 per cent of the farm operators in my county. The farms were to be randomly sampled from farms that were *above* the average acreage in my county. I was to interview the farm operator to determine how many people were employed on each farm, what specifically they did, how much they earned, the job turnover, and abilities, skills, and tools that each employed person should possess. Moreover, I was to find out from the farm manager what he thought the farm workers should know and be able to do, how much formal education he thought they should have, and the salary each employee would receive in 1970. Finally, I was to find out when each person was expected to retire or leave farming so that plans could be made to replace them with well-qualified individuals.

I left the meeting feeling much better than when I arrived. This project seemed sensible and would provide information that is worth while for revising the vocational agriculture program.

The records showed the average size farm in my county to be 183 acres. The farms in the other 12 counties are larger than this. There are 291 farms in the county with above average acreage. This meant I was to interview 29 farm operators and report on the farms that they manage.

Research Helped Me

After my first two interviews, it became obvious that I would benefit from this survey. From a 10 per cent random sample, I got a reasonably good picture of the farms and farm operators in my county. It was surprising to me how little I knew about farmers in Webster County.

After seven years in a county, things tend to become routine and somewhat in a rut. The majority of the farm operators contacted were fathers of present or former students of vocational agriculture.

This activity provided me an opportunity to meet many good farmers whom I had not had an opportunity to know. I learned that it is possible for them to do a good job farming without help from me or other professional people who work with farmers. A conclusion is that we need to broaden and enrich our program in vocational agriculture to involve more farmers.

Outlook

When the survey is compiled, a complete picture of the type and size of farm in this area of the State will be available. It should show how many men are actually farming, when they will need replacing, and what, in these farmers' opinion, the replacements should know in order to do a better job of farming.

I feel the survey has been a success and have met many new farmers who were eager to cooperate in a study of this type. Many things were discovered in the county that I did not know. The image I now have of farming in my county has been updated. I feel I can do a better job of teaching vocational agriculture because I have an up-to-date concept of the problems in the business of farming. I know I can do a better job planning and carrying out a research project.

When the opportunity presents itself for teachers of agriculture to become involved in surveys and other research projects, I recommend that they cooperate. I trink they will be surprised. They will learn of the problems and immediate needs of the community. I am confident they will become more proficient teachers of agriculture as a result of this experience. To be a member of a research team in a project of this nature is an upgrading and satisfying experience for teachers.

"I am confident that they will become more proficient teachers as a result of this experience."

*Mr. West is one of the 13 interviewers for this study.

Studies in Progress—1966-1967

GENE M. LOVE, Teacher Education, Pennsylvania State University,
and Chairman, Ag Division, AVA Research Committee

The following lists of studies in progress in agricultural education in the United States have been compiled by members of the Research Committee, Agriculture Division American Vocational Association. The lists are compiled annually by the committee for supervisors, teacher educators, and teachers interested in the current efforts of fellow researchers.

Additional copies of regional lists may be obtained by writing to your regional representative as noted below. Specific information about individual studies may be secured by writing the investigator. Copies of regional publications of Studies *Completed* in Agricultural Education may also be obtained from your regional representative to the Research Committee.

Gene M. Love

J. Robert Warmbrod

CENTRAL REGION

(Compiled and edited by J. Robert Warmbrod, University of Illinois)

AMBERSON, MAX. The Need for Vocational Education in Small Isolated Schools in Mountain States. Thesis, Ph.D. Department of Agricultural Education, Ohio State University.

ANDREW, NEAL D. An Analysis of Present and Potential Interstate Cooperation in Vocational Education. Thesis, Ph.D. Department of Agricultural Education, Ohio State University.

ARCHER, CLYDE. A Follow-up Study of Graduates of the College of Agriculture and Home Economics at the Ohio State University. Thesis, M.S. Department of Agricultural Education, Ohio State University.

BAKER, RICHARD L. The Use of Profit Maximizing Principles in Teaching Agriculture. Thesis, Ph.D. Department of Agricultural Education, Ohio State University.

BEAVER, RONALD. Competencies in Labor Utilization Needed by Iowa Farmers. Thesis, M.S. Department of Education, Iowa State University.

BECKLEY, JAMES R. Public Relations Activities of Ohio Teachers of Vocational Agriculture. Thesis, M.S. Department of Agricultural Education, Ohio State University.

BENDER, RALPH E. Continuing Study of Occupational Status of Recent Graduates of Vocational Agriculture in Ohio Staff Study. Department of Agricultural Education, Ohio State University.

BENTLEY, R.R. Changing Teacher Morale: An Experiment in Feedback of Identified Problems to Teachers and Principals. Staff study (USOE grant). Department of Education, Purdue University.

BENTON, RALPH R. An Analysis of the Extra-Curricular Activities of Selected University Graduates and Their Relation to Measurement of the Leadership Function. Staff study. School of Agriculture, Southern Illinois University.

BODE, JOHN. Factor Which Influence Attendance in an Adult Farmer Class. Thesis, M.S. Department of Education, Iowa State University.

BOGLE, ROY. Knowledge of High School Students Concerning Understanding and Skills Required for Success in Agricultural Careers. Thesis, M.S. Department of Agricultural Education, Ohio State University.

BOHMABACH, NORMAN. The Utilization of the Classroom Laboratory for Instructing High School Students by Minnesota Vocational Agriculture Instructors During 1964-1965. Colloquium, M.A. Department of Agricultural Education, University of Minnesota.

BRUM, KEITH E. An Evaluation of Advanced Teacher Certification Standards for Vocational Agriculture Teachers. Thesis, M.S. Department of Agricultural Education, Ohio State University.

BUSSE, NORMAN. A Ten Unit Presentation of Teaching Outlines for a Unit Operation Method of Instruction in Farm Machinery. Colloquium. M.A. Department of Agricultural Education, University of Minnesota.

CARPENTER, FRANK R. A Study of the Relationship Between Vocational Agriculture Instructors' Activities and Attitudes and Their Students' Attendance in a College of Agriculture. Thesis, Ed.D. Department of Agricultural Education, University of Missouri.

CHRISTENSEN, HOWARD. Education for Off-Farm Agricultural Occupations in Nevada. Thesis, Ph.D. Department of Agricultural Education, Ohio State University.

CROSS, IRVING. Scholastic Achievement of Vocational Agriculture Students Enrolled at Colorado State University. Thesis, Ph.D. Department of Agricultural Education, Ohio State University.

FULLER, GERALD R. and PHIPPS, LLOYD J. Education Regarding Credit for Agricultural Production. Staff study. Division of Agricultural Education, University of Illinois.

GROVES, RAMSEY. Unique Characteristics of Programs of Vocational Education for Youth with Special Needs. Thesis, Ph.D. Department of Agricultural Education, Ohio State University.

GROVES, ROBERT. Advisers' Perceptions of 4-H Club Work. Thesis, M.S. Department of Agricultural Education, Ohio State University.

GUILER, GILBERT S. Needed Adjustments in the Vocational Agriculture Curriculum to Provide Vocational Experience in Agricultural Occupations as Seen by School Administrators. Staff study. Department of Agricultural Education, Ohio State University.

GUILER, GILBERT S. Role Analysis of the Perceptions of Beginning Vocational Agriculture Teachers and Their Professional Difficulties in Role Performance. Staff study. Department of Agricultural Education. Ohio State University.

HAMILTON, JAMES. Vocational Education in Agriculture for Youth with Special Needs. Thesis, Ph.D. Department of Agricultural Education, Ohio State University.

HARPER, JOSEPH. Competencies in Swine Production Needed by Farmers. Thesis, M.S. Department of Education, Iowa State University.

HEMP, PAUL E. Ornamental Horticulture for the Midwestern Section of the United States. Staff study (USOE) grant). Division of Agricultural Education, University of Illinois.

HICKMAN, ROY. Factors Related to Farm Record and Business Analysis Systems Used by Farm Operators in Iowa. Thesis, Ph.D. Department of Education, Iowa State University.

HOERNER, HARRY. Competencies in Farm Electrification Needed by Males Engaged in Farming. Thesis, M.S. Department of Education, Iowa State University.

IVY, ROBERT. Employment Opportunities and Training Needs in Agri-Business for Students of Vocational Agriculture. Thesis, M.S. Department of Agricultural Education, Ohio State University.

JARRETT, VON H. A Study of Mechanical Jobs Performed by Selected Farmers in Utah. Thesis, Ed.D. Department of Agricultural Education, University of Missouri.

KAHLER, ALAN. Factors Related to the Occupations of Nebraska Farm Male High School Graduates. Thesis, Ph.D. Department of Education, Iowa State University.

KELLY, WARREN G. An Evaluation of the Pre-Service Agricultural Education Curriculum at West Virginia University. Thesis. Ed.D. Department of Agricultural Education, University of Missouri.

KERWOOD, ROBERT. A Study of the Relationship of Occupational Experience and Success in Teaching Vocational Agriculture. Thesis, Ph.D. Department of Agricultural Education, Ohio State University.

KORDICK, WAYNE. Competencies in Machinery Program Planning Needed by Farmers. Thesis, M.S. Department of Education, Iowa State University.

LATTIMER, EVERETT G. Guidelines for Developing a State-wide System of Area Schools. Thesis, Ph.D. Department of Agricultural Education, Ohio State University.

LIFER, CHARLES. Role Expectations of the Area Extension Agent, 4-H. Thesis, M.S. Department of Agricultural Education, Ohio State University.

MAYER, LEON A. Occupational Education for Selected Animal Science Jobs. Thesis. Ed.D. Division of Agricultural Education, University of Illinois.

McCORMICK, FLOYD G. Further Refinement of an Instrument for Measuring Understanding of Profit Maximizing Principles. Staff study. Department of Agricultural Education, Ohio State University.

McCORMICK, ROBERT W. Communication Concepts for Developing Increased Competence Among Cooperative Extension and Vocational Agriculture Educators. Staff study. Department of Agricultural Education, Ohio State University.

McCORMICK, ROBERT W. A Longitudinal Evaluation of Area Extension Centers in Ohio. Staff study. Department of Agricultural Education, Ohio State University.

McGHEE, CLAUDE. Professional Needs of Teachers of Vocational Agriculture. Thesis, Ph.D. Department of Agricultural Education, Ohio State University.

MEHTA, R.C. Measures of Leader Behavior and Their Relation to Innovativeness of County Extension Agents. Thesis, Ph.D. Department of Agricultural Education, Ohio State University.

MORROW, CHARLES. Competencies in Agriculture Needed by Seed Production and Distribution Company Employees. Thesis, M.S. Department of Education, Iowa State University.

NATTRESS, WAYNE. Competencies in Agronomy Needed by Vocational Agriculture Instructors. Thesis, M.S. Department of Education, Iowa State University.

NIRODE, BERNARD. An Analysis of the Experience Programs Provided by Vocational Horticulture Programs in Ohio High Schools. Thesis, M.S. Department of Agricultural Education, Ohio State University.

PHILIPSON, WILLIARD. Effectiveness of Selected Films on Learning Biological Concepts. Thesis, Ph.D. Department of Agricultural Education, University of Minnesota.

PHIPPS, LLOYD J. and FULLER, GERALD R. Development of Human Resources Through a Vocationally Oriented Educational Program for Disadvantaged Families in Depressed Rural Areas (Project REDY). Staff study (USOE grant). Division of Agricultural Education, University of Illinois.

RAWLES, RICHARD. Criteria for Establishment of Area Vocational-Technical Schools in Selected Areas of Wyoming. Colloquium, M.A. Department of Agricultural Education, University of Minnesota.

REIDEL, WALLACE. Competencies in Agriculture Needed by Males Engaged in Livestock Auction Markets. Thesis, M.S. Department of Education, Iowa State University.

NORTH ATLANTIC REGION

(Compiled and edited by Gene M. Love, Pennsylvania State University)

BARBER, WILLIAM G. The Self-perceived Educational Needs of Dropouts of Newport County Schools, 1965-66. Thesis, M.S., Division of Teacher Education in Agriculture, University of Rhode Island.

BARWICK, RALPH P. A Survey of the Status of Students Who Matriculated in the S. Hallock duPont School of Applied Agricultural Science. Staff Study, Department of Agricultural Education, University of Delaware.

BAY, WALTER. A Study of Personal and Social Development of 4-H Club Members in Ten Selected Counties in Maryland. Thesis, M.S., Department of Agricultural and Extension, University of Maryland.

BENSON, ROBERT T. An Experiment of In-Service Teaching of Controls Employed in Agricultural Automations. Thesis, D.Ed., Department of Agricultural Education, The Pennsylvania State University.

BOSSARD, KERMIT L. A Comparison of Personal and Social Development of 4-H and Non 4-H Members. Thesis, M.S., Department of Agricultural and Extension Education, University of Maryland.

BUILA, THEODORE. The System of Agricultural Education in Yugoslavia and Its Effects on Agricultural Manpower Development. Thesis, Ph.D. Agricultural Education Division, Cornell University.

CRISPIN, EDWIN A. The Migratory Habits of 4-H Club Boys on the Maryland Eastern Shore. Thesis, M.S., Department of Agricultural and Extension Education, University of Maryland.

CUNNINGHAM, JENNINGS D. A Dairy Program for Western Pennsylvania Area. Department of Agricultural Education, West Virginia University.

DECKMAN, DONALD E. Development of a Nursery Design and of a List of Tools and Equipment for Secondary Schools Planning Ornamental Horticulture Programs. Thesis, M.Ed., Department of Agricultural Education, The Pennsylvania State University.

DEREGONGAN, MACAUROG B. Problems in the Local Administration of Agricultural Schools in the Philippines. Thesis, M.S., Agricultural Education Division, Cornell University.

DOWNER, HOWARD I. A Developmental Approach to the Establishment of Education in Agriculture Resources in Public Schools. Thesis, D.Ed., Department of Agricultural Education, The Pennsylvania State University.

EDGECOMB, PETER. The Impact of Admitting Girls to Membership in the FFA. Thesis, M.S., Department of Agricultural and Extension Education, University of Maryland.

ELLIS, WILLIE T. An Assessment and Analysis of Curriculum Innovations in North Carolina Vocational Agriculture Departments. Thesis, Ph.D., Agricultural Education Division, Cornell University.

EVANS, DONALD E. Characteristics of Blair County Agriculture Students Who Dropped Out of High School. Thesis, M. Ed., Department of Agricultural Education, The Pennsylvania State University.

GINGERICH, GARLAND E. The Effectiveness of Two Methods of Teaching the Safe Use of Pesticides to Vocational Agriculture Students in Lancaster County. Thesis, M.Ed., Department of Agricultural Education, The Pennsylvania State University.

GOODWIN, WALTER B. Audio Visuals for Vocational Agriculture Teachers. Thesis, M.S. Department of Agricultural Education, West Virginia University.

GRIFFITH, ELLIS J. An Analysis of Factors Related to the Costs of Owning and Operating and of Custom Hiring Forage Harvesters on Selected Farms in Huntingdon County, Pennsylvania. Thesis, M.Ed., Department of Agricultural Education, The Pennsylvania State University.

GUTSHALL, VIRGIL E. Development and Evaluation of a Unit of Instruction in Hydraulics for High School Vocational Agriculture Students. Thesis. M.Ed., Department of Agricultural Education, The Pennsylvania State University.

HAMILTON, WILLIAM H. Development of a Scale to Measure Interests in Agriculture. Thesis, Ph.D. Agricultural Education Division, Cornell University.

HARRIS, OSCAR J. An Investigation of Some Needs for Expansion of Vocational Education in Monongalia, Preston and Taylor Counties of West Virginia. Thesis, M.S., Department of Agricultural Education, West Virginia University.

HARVEY, KEITH M. Why Teachers of Agriculture in New York State Leave the Teaching Profession. Thesis, M.Ed., Agricultural Education Division, Cornell University.

HOOPER, EDGAR. Structuring An Adult Farmer Organization Within Adult Farmer Classes in Vo-Ag. Thesis, M.S., Department of Agricultural Education, West Virginia University.

HOOVER, N. K. AND STEVENS, GLENN Z. Development and Evaluation of Occupational Information in Agriculture. Staff Study, Department of Agricultural Education, The Pennsylvania State University.

KING, JAMES C. School Dropouts and Vocational Agriculture in Predominantly Non-white High Schools in Maryland. Thesis, M.S., Department of Agricultural and Extension Education, University of Maryland.

KLEMENT, JERRY. A life History Approach to the Identification of Leadership Potential of 4-H Members. Thesis, M.S., Department of Agricultural and Extension Education, University of Maryland.

KUMMARGUDA, VIJAYA K. Procedures and Methods of Conducting Group Onfarm Instruction in India. Thesis, M.S., Agricultural Education Division, Cornell University.

LAREW, TULLY. A Vo-Ag Program and Equipment for Comprehensive High Schools in Monroe County. Thesis, M.S., Department of Agricultural Education, West Virginia University.

LONG, JERRY W. Programmed Learning For Vo-Ag. Teaching. Thesis, M.S., Department of Agricultural Education, West Virginia University.

LONGWELL, JERRY F. An Analysis of Sheep Production Practices Among Farmers in Armstrong, County, Pennsylvania. Thesis, M.Ed., Department of Agricultural Education, The Pennsylvania State University.

LORD, CARLTON R. Development and Evaluation of a Rating Scale for Appraising Written Units of Instruction. Thesis, M.S., Department of Agricultural Education, The Pennsylvania State University.

MARTIN W. HOWARD. Developing Occupational Experience Programs in Agriculture. Paper. Staff Study (U.S.O.E. Grant) School of Education.

McGILL, LYNN R. A Rationale for Change in Rural Youth Organizations. Essay, M.Ed., Agricultural Education Division, Cornell University.

McCLAY, DAVID R. Preparation and Evaluation of a Resource Unit and Teaching Guide for Teaching the Basic Principles of Automatic Controls of Farm Power, Farm Machinery and Other Agricultural Applications to High School Students, and Adults. Staff Study, Department of Agricultural Education, The Pennsylvania State University.

MERCER, R. JACK. Knowledge and Competencies Needed in Greenhouse Occupations As Indicated By Achievement Tests and Ratings by Employers, Employees, Teachers and Students. Thesis. D.Ed., Department of Agricultural Education, The Pennsylvania State University.

MICHAEL, DAYTON J. An Outdoor Recreation Program for Marion County, Thesis, M.S., Department of Agricultural Education, West Virginia University.

MOORE, DONALD J. A Study of the Relationships of Certain Employee Characteristics to Related Performance and Tenure of Selected Virginia County Extension Agents. Thesis, M.S., Department of Agricultural and Extension Education, University of Maryland.

NELSON, LEONARD. The Use of Programmed Instructional Materials in the Educational Program of the Cooperative Extension Service. Thesis, M.S., Department of Agricultural and Extension Education, University of Maryland.

NORTON, ROBERT E. Using Programed, Instruction With and Without Skills Training to Teach Psychomotor Skills. Thesis, Ph.D., Agricultural Education Division, Cornell University.

PENNINGTON, FOREST M. A Public Relations Program for Vocational Agriculture. Thesis, M.S., Department of Agricultural Education, West Virginia University.

PRESCOTT, RICHARD G. A Study of Selected Characteristics and Current Types of Employment of College of Agriculture Graduates. Thesis, M.S., Division of Teacher Education in Agriculture, University of Rhode Island.

ROBINSON, GEORGE A. In-Service Education Needs of Teachers in Off-Farm Agricultural Occupations. Thesis, Ed. D. Agricultural Education Division, Cornell University.

SCANLON, JAMES A. The Relative Effectiveness of Supplementing Programed Instruction with Blocked Versus Spaced Review. Thesis, Ph.D., Agricultural Education Division, Cornell University.

SCHUKRAFT, RICHARD. The Training Needs of 4-H Local Leaders in Three Selected Counties in Maryland, Thesis, M.S., Department of Agricultural and Extension Education, University of Maryland.

SIMPLER, KENNETH. School Dropouts and Vocational Agriculture in Predominantly White High Schools in Maryland. Thesis, M.S., Department of Agricultural and Extension Education, University of Maryland.

SKIDMORE, HAROLD K. Follow-up Study of Those Who Took Vo-Ag at Sutton High School. Thesis, M.S., Department of Agricultural Education, West Virginia University.

ROLLOFF, JOHN A. The Development of a Model Design to Assess Instruction in Farm Management in Terms of Economic Returns and the Understanding of Economic Principles. Thesis, Ph.D. Department of Agricultural Education, Ohio State University.

SCHROEDER, EDWIN. Competencies in Soybean Production Needed by Farmers. Thesis, M.S. Department of Education, Iowa State University.

SOLDWISH, REGINALD. Competencies in Agriculture Needed by Males Engaged in Agricultural Building Construction. Thesis, M.S. Department of Education, Iowa State University.

SPENCER, NORBERT D. Competencies in Agriculture Needed by Livestock Buyers. Thesis, M.S. Department of Education, Iowa State University.

SPENGLER, VERNE. Agricultural Mechanics. Facilities Available in Minnesota High Schools. Colloquium, M.A. Department of Agricultural Education, University of Minnesota.

STITT, THOMAS R. Skills, Knowledge, and Experience Required in the Area of Agricultural Mechanics for Employment in Occupations Other Than Farming. Thesis, Ph.D. Department of Agricultural Education, Ohio State University.

SUMNER, DOUGLAS. An Evaluation of the Effectiveness of Participation in Leadership Activities in the FFA. Colloquium, M.A. Department of Agricultural Education, University of Minnesota.

SUTTON, CONRAD. Occupational and Financial Outcomes of Farmer Vo-Ag Students in Wyoming with Curricular Implications. Colloquium, M.A. Department of Agricultural Education, University of Minnesota.

TAYLOR, ROBERT E. An Analysis of the Role of State Supervision of Vocational Agriculture. Staff study. Center for Vocational and Technical Education, Ohio State University.

THACKER, JAMES H. A study of the Factors Affecting Academic Success of Majors in the College of Agriculture at the University of Missouri. Thesis, Ed.D. Department of Agricultural Education, University of Missouri.

TOEDTER, PHILLIP. An Improved Analysis of the Crop Enterprise with Emphasis on Machinery and Associated Noncash Costs. Colloquium, M.A. Department of Agricultural Education. University of Minnesota.

WARMBROD, J. ROBERT. Development of World of Work, Instructional Programs. Staff study. Division of Agricultural Education, University of Illinois.

WHITE, ROBERT. Educational Programs for Preparing Horticultural Technicians. Thesis, Ph.D. Department of Agricultural Education, Ohio State University.

WOLF, WILLIARD H. A Nine Year Comparison of Grade Performance of Agricultural Education Majors with Students in the College of Agriculture and Home Economics and the Entire University. Staff study. Department of Agricultural Education, Ohio State University.

WOLF, WILLARD H. Vocational Preferences of Beginning Students in Agricultural Education. Staff study. Department of Agricultural Education, Ohio State University.

WOOD, EUGENE S. Evaluation of Post-High School Programs in Agriculture. Staff study. School of Agriculture, Southern Illinois University.

WOODIN, RALPH J. The Supply and Demand for Teachers of Vocational Agriculture in the United States, 1966-1969. Staff study. Department of Agricultural Education, Ohio State University.

ZIEGLER, CLARENCE. Competencies in Agriculture Needed by Hatchery Industry Employees. Thesis, M.S. Department of Education, Iowa State University.

(*Continued*)

Studies in Progress
(Continued)

PACIFIC REGION

(Compiled and edited by C. Oscar Loreen, Washington State University)

BARNES, ROBERT F. A Study of Disadvantaged Laborers (Farm Migrants) and Their Families. Staff Study, Department of Agricultural Education, University of California, Davis.

BLAKELY, MICHAEL. A Study of Those Schools in Eastern Washington Which Offer No Vocational Education. Thesis, M.S., Agricultural Education, Washington State University, Pullman.

CHAMBERS, JOHN. Agricultural Principles Basic to Animal Science. Thesis, Master's Study, Department of Agricultural Education, Oregon State University, Corvallis.

CHRISTENSEN, FRED M. A Study of Off-Farm Occupations in Rich, Cache, and Box Elder Counties to Determine Educational Needs. Thesis, M.S., Department of Agricultural Education, Utah State University, Logan.

COBB, RICHARD A. Determining the Job Opportunities Available for Students Graduating from a Two-Year Technical Program in Farm Mechanics and Ornamental Horticulture. Thesis, M. Ag. Ed., Department of Agricultural and Extension Education, New Mexico State University, University Park.

DAVIS, GARTH. Occupational Study of Umatilla County. Thesis, Master's Study, Department of Agricultural Education, Oregon State University, Corvallis.

DUNHAM, DAN. Responsibilities of Industrial Agencies in Vocational Education. Ph.D., Department of Agricultural Education, Oregon State University, Corvallis.

FAULKS, FREDERICK G. A Study of the Role of the Vocational Agriculture Instructor in Relation to Influencing Vocational Agriculture Students to Major in Agricultural Education in Idaho. Thesis, M.S., Department of Agricultural Education, University of Idaho, Moscow.

HANSEN, CHESTER K. A Study to Determine Probable Employment Opportunities and Agricultural Knowledges Needed by Employees in Nursery. Greenhouse, Landscape and Chemical Applicator Businesses in King County, Washington. Thesis, M.S., Agricultural Education, Washington State University, Pullman.

HELMICK, ROBERT. Feasibility Study for Area Vocational School. Thesis, Master's Study, Department of Agricultural Education, Oregon State University, Corvallis.

HOLMQUIST, LARRY P. A Follow-Up Study of the Future Farmers of America Members Who Earned the State Farmer Degree in Idaho from 1955 through 1960. Thesis, M.S., Department of Agricultural Education, University of Idaho, Moscow.

HOWELL, RICHARD S. The Need for a Course of Study in Turf Grass Management in Schools of Southwest Washington. Thesis, M.S., Agricultural Education, Washington State University, Pullman.

IVERSON, MAYNARD. Opportunities in Agricultural Occupations, Department of Vocational Education (Agricultural Section), Colorado State University, Fort Collins.

IVORY, ROYAL. Developing an Agricultural Information Program for Elementary Schools. Thesis, Master's Study, Department of Agricultural Education, Oregon State University, Corvallis.

KOON, SIDNEY. Employment Opportunities in Agricultural Occupations. Master's Report, Department of Vocational Education, (Agricultural Section), Colorado State University, Fort Collins.

LACY, JAMES. Determining Vocational Program Needs in Klamath County, Oregon. Thesis, Master's Study, Department of Agricultural Education, Oregon State University, Corvallis.

LOEWEN, CURT. Evaluation of Join OSU-Thailand Agricultural Programs. Ph.D., Department of Agricultural Education, Oregon State University, Corvallis.

LYDA, HARRY. Comparing High School and College Grades. Master's Study, Department of Agricultural Education, Oregon State University, Corvallis.

MOORE, RICHARD D. A Study of the Importance of the Maintenance and Repair of Farm Machinery Hydraulic Systems in Latah County, Idaho. Thesis, M.S., Department of Agricultural Education, University of Idaho, Moscow.

REUBEN, ROEHL. Opportunities for Establishment in Farming. Master's Report, Department of Vocational Education (Agricultural Section), Colorado State University, Fort Collins.

SCOTT, RON. Developing an Urban 4-H Program. Master's Study, Department of Agricultural Education, Oregon State University, Corvallis.

SHAH, JAFAR A. Skills and Abilities Needed by Agricultural Teachers in West Pakistan. Thesis, M.S., Agricultural Education, Washington State University, Pullman.

SHIPLEY, WILLIS E. Feasibility Study of Vocational Agriculture in Secondary Schools in The Province of Alberta. Thesis, M.S., Department of Agricultural Education, Utah State University, Logan.

SMITH, DYLE. A Study to Determine Why Some Administrators in Washington State Prefer Not to Include Vocational Agriculture in Their High School Curriculum. Thesis, M.S., Agricultural Education, Washington State University, Pullman.

SORENSEN, LLOYD L. The Occupational Status of Vocational Agricultural Graduates From Idaho High Schools Over the Five Year Period 1960-1964. Thesis, M.S., Agricultural Education Department, Utah State University, Logan.

STOCKER, CHARLES G. A Study of the Education Needed for Entry Into Nursery and Turf Management Occupations in the Spokane Area. Thesis, M.S., Agricultural Education, Washington State University, Pullman.

VAN HOUTEN, RICHARD J. An Evaluative Study of Public Relations Activities in Regard to Vocational Agriculture in Idaho. Thesis, M.S., Department of Agricultural Education, University of Idaho, Moscow.

WALLACE, HARVEY R. The Status of Vocational Agriculture Advisory Councils in Idaho. Thesis, M.S., Department of Agricultural Education, University of Idaho, Moscow.

WARD, DARREL. Development and Operation of a Statewide Vocational Education Leadership Program. Ph.D., Department of Agricultural Education, Oregon State University, Corvallis.

WHITMORE, LOREN E. Financing F.F.A. Chapters. Master's Report, Department of Vocational Education (Agricultural Section), Colorado State University, Fort Collins.

WRIGHT, EARL E. Need for Employees in Non-Farm Agricultural Occupations. Master's Report, Department of Vocational Education (Agricultural Section), Colorado State University, Fort Collins.

North Central Region
(Continued)

SMITH, NORMAN. A Comparative Study of Agricultural Extension Programs in the Piedmont Region of Maryland as Related to the Expressed Needs of Commercial Farm Operators. Thesis, M. S., Department of Agricultural and Extension Education, University of Maryland.

STEVENS, GLENN Z. Organization and Pilot Program Testing of Curriculum Materials for Occupational Education in Agricultural Resources. Staff Study, Department of Agricultural Education, The Pennsylvania State University.

STILES, PHILIP AND MARTIN, W. HOWARD. A Guide for Curriculum Experimentation in Food Handling and Distribution in High School and Post-High School Vocational Training. Non-thesis Study. Poultry Science in Cooperation with School of Education.

TOWNE, DOUGLAS C. Influences Exerted Upon Subject Response Scale Structural Elements of Attitude Scales. Thesis, Ph.D., Agricultural Education Division, Cornell University.

VIA, BOBBY E. Need For and Construction of Farm Shops on Monroe County Farms. Thesis, M.S., Department of Agricultural Education, West Virginia University.

ZEIGLER, MARILYN. The Identification of Leadership Potential Among 4-H Leaders. Thesis, M.S. Department of Agricultural and Extension Education, University of Maryland.

SOUTHERN REGION

(Compiled and edited by Richard A. Baker, Auburn University)

Richard A. Baker

BAKER, R. A., "An Analysis of the Organization and Operational Patterns of Multiple-Teacher Departments of Vocational Agriculture in the Southeastern States," Staff Study, Department of Vocational, Technical and Practical Arts Education, Auburn University, Auburn, Alabama.

BAKER, R. A., "A Study of Employment Complexes and Occupational Categories of Former Students in Alabama High Schools Offering Vocational Agriculture," Staff Study, Department of Vocational, Technical and Practical Arts Education, Urburn University, Auburn, Alabama.

BAKER, R. A., "A Study of the Perception of School Administrator and Board Members Concerning Selected Aspects of the Program of Vocational Agriculture in Alabama," Staff Study, Department of Vocational, Technical and Practical Arts Education, Auburn University, Auburn, Alabama.

BASS, B. C., "Learning Outcomes of the Educational Program Pertaining to Farmer Cooperatives in High School Departments of Vocational Agriculture in Virginia," Staff Study, Department of Education, Virginia Polytechnic Institute, Blacksburg, Virginia.

BASS, B. C., "Employment Opportunities for and Vocational Training Needed by Workers in Non-Farm Agricultural Occupations in Carroll and Grayson Counties and the City of Galax, Virginia," Staff Study, Department of Education, Virginia Polytechnic Institute, Blacksburg, Virginia.

BEARD, H. G. and C. H. ROGERS, "Policy, Organization and Finance for Occupational Education," Report, Center for Research, Development and Training in Occupational Education, N. C. State University, Raleigh, N. C.

BROOKS, JAMES B., "Role Conflicts of the Vocational Education Teacher," Report for the Center for Occupational Education, Department of Agricultural Education, North Carolina State University, Raleigh, N.C.

BRUTON, JOHN C., "The Effect of Vocational Agriculture Class Enrollment and Farm Year Students Enrolled in Oklahoma Colleges of Experience on Animal Science Knowledge of First Year Students Enrolled in Oklahoma Colleges of Agriculture," Dissertation, Ed. D., Department of Agricultural Education, Oklahoma State University, Stillwater, Oklahoma.

Southern Region
(Continued)

BRYANT, C. DOUGLAS, "Teacher Perceptions on In-Service Education," Staff Study, Department of Agricultural Education, N. C. State University, Raleigh, N. C.

BRYANT, C. DOUGLAS, "Attitudes Toward Learning Before and After Student Teaching and Three Years Later," Staff Research Report, Department of Agricultural Education, N. C. State University, Raleigh, N. C.

CAMPBELL, DONALD R., "Job Opportunities and Training Needs in Off-Farm Agricultural Occupations in Concordia Parish, Louisiana," Master's Thesis, Department of Agricultural Education, Louisiana State University, Baton Rouge, Louisiana.

CARTER, RICHARD I., "A Comparison of Mechanical Aptitude Between State FFA Interscholastic Farm Shop Contest Participants and Non-Participating Oklahoma Vocational Agriculture Students," Report, M. S., Department of Agricultural Education, Oklahoma State University, Stillwater, Oklahoma.

CHRISTIANSEN, JAMES E., "Determination of Teaching-Learning Experiences and Teaching Aids for Broadened Programs of Vocational Agriculture," Staff Study, Department of Agricultural and Extension Education, University of Florida, Gainesville, Florida..

CHRISTIANSEN, JAMES E. "Determination of Agricultural Curricula for Post-High School Programs in Community Colleges and Area Vocational Schools," Staff Study, Department of Agricultural and Extension Education, University of Florida, Gainesville, Florida.

CUPP, WAYNE WINE. "How Young Farmers in Rockingham County (Virginia) Become Established in Farming," Master's Thesis, Department of Education, Virginia Polytechnic Institute, Blacksburg, Virginia.

CURTIS, CHARLIE M., "Development of Training Programs for Youth Preparing to Enter Non-farm Agricultural Jobs," Staff Study, Department of Agricultural Education, Louisiana State University, Baton Rouge, Louisiana.

DEAN, C. E., "What Should Constitute the Major Program for Training Teachers of Vocational Agriculture for the Present and Future," Staff Study, North Carolina Agricultural and Technical College, Greensboro, North Carolina.

FORREST, LEWIS C., JR., "Role Expectations Held for Teachers of Vocational Education," Report for the Center for Occupational Education, Department of Agricultural Education, North Carolina State University, Greensboro, North Carolina.

GAYLORD, ONWARD J., JR., "The Teacher of Vocational Education as an Adopter of New Practices," Report for the Center for Occupational Education, Department of Agricultural Education, North Carolina State University, Greensboro, North Carolina.

HASH, J. ALEX, "The Construction of a Standardized Achievement Test in Forestry," Doctoral Thesis, Department of Agricultural Education, Clemson University, Clemson, South Carolina.

HASSELL, JOHN L., "Teacher Adoption of Option Courses," Master's Thesis, Department of Agricultural Education, N. C. State University, Raleigh, North Carolina.

HOERNER, HARRY J., "The Effect of Counseling on Employment Tenure of MDTA Farm Mechanic Class Participants," Dissertation, Ed. D., Department of Agricultural Education, Oklahoma State University, Stillwater, Oklahoma.

HILL, BILLY H., "A Study of Relationships Among STEP Percentiles, Size of High School, Collegiate Transfer Status, and FFA Degrees Upon Academic Achievement of Oklahoma State University Agricultural Education Graduates for the Years 1961 Through 1966," Report, M. S., Department of Agricultural Education, Oklahoma State University, Stillwater, Oklahoma.

HOLT, RAYMOND A., "An Evaluation of a Handbook of Student Experiences in Agricultural Credit," Master's Thesis. Department of Agricultural Education, College of Education, University of Tennessee, Knoxville, Tennessee.

HULL, WILLIAM L., "Factors Associated With the Choice of a Vocational Agriculture Teaching Career and Teacher Tenure in Oklahoma, Staff Study, Department of Agricultural Education, Oklahoma State University, Stillwater, Oklahoma.

HYDE, WILLIAM S., "Agricultural Opportunities and Training Needs of Vocational Agriculture Students in Tangipahoa Parish," Master's Thesis, Department of Agricultural Education, Louisiana State University, Baton Rouge, Louisiana.

JACKS, LLOYD P., "Development and Use of Subject Materials for Vocational Education in Agriculture," Doctoral Dissertation, Department of Agricultural Education, Louisiana State University, Baton Rouge, Louisiana.

JACKS, LLOYD P., "Basic Social and Educational Competencies Essential for Initial and Continued Employment in Agricultural Occupations," Master's Report, Department of Agricultural Education, Louisiana State University, Baton Rouge, Louisiana.

JENSEN, ARTHUR K., "Improving Procedures for Producing Overhead Transparencies with the Ultimate Aim of Incorporating These Techniques into the Development of a Regional Curricular Materials Center for Vocational Education," USOE Project No. 6-8320, Staff Study, Department of Agricultural Education, Clemson University, Clemson, South Carolina.

JONES, CHARLES I., "Adult Students' Perception of Selected Verbal Competencies in Manual Skill Development Courses," Research Paper, Department of Agricultural Education, N. C. State University, Raleigh, North Carolina.

JONES, CHARLES I., "An Evaluation of Teacher Competencies in Adult Farm Short Courses," Research Paper, Department of Agricultural Education, N. C. State University, Raleigh, N. C.

JONES, CHARLES I., "Adult Farmer Television Pesticide Course: An Evaluation," Staff Study, Department of Agricultural Education, N. C. State University, Raleigh, N.C.

JONES, CHARLES I., "An Evaluation of Adult Participation in Home Beautification Courses via Television," Staff Study, Department of Agricultural Education, N. C. State University, Raleigh, N. C.

KNIGHT, JAMES M., "Competencies Needed by Workers on Large Dairy Farms," Master's Thesis, Department of Agricultural Education, Mississippi State University, State College, Mississippi.

LETLOW, JAMES C., "A Suggested Program Outline in Vocational Agriculture for Richland Parish, Master's Thesis, Department of Agricultural Education, Louisiana State University, Baton Rouge, Louisiana.

LOFTEN, W. T. and LEON A. SIMS., "Determination of a Curriculum Guide for Constructing Courses in Vocational Agriculture for Florida Schools," Staff Study, Department of Agricultural and Extension Education, University of Florida, Gainesville.

LONG, WILLIAM B., "A History of Vocational Agriculture in Tennessee from 1917 to 1955," Master's Thesis, Department of Agricultural Education, College of Education, University of Tennessee, Knoxville, Tennessee.

MANASCO, CLARENCE E., "Employment Opportunities in Professional Agricultural Careers in Louisiana," Doctoral Dissertation, Department of Agricultural Education, Louisiana State University, Baton Rouge, Louisiana.

MARTIN, ROBERT R., "A Handbook for Prospective Students in Vocational Agriculture in Louisiana," Master's Report, Department of Agricultural Education, Louisiana State University, Baton Rouge, Louisiana.

McKINNON, GEORGE B., "Conducting a Non-Farm Agricultural Work Experience Program in Vocational Agriculture," Master's Report, Department of Agricultural Education, Louisiana State University, Baton Rouge, Louisiana.

McKINNON, GEORGE B., "A Guide for a Cooperative Non-Farm Agricultural Work Experience Program In Vocational Agriculture," Master's Thesis, Department of Agricultural Education, Louisiana State University, Baton Rouge, Louisiana.

MILLER, TEXTON R., "Teacher Perception of Principal's Views on Vocational Education," Staff Study, Department of Agricultural Education, N. C. State University, Raleigh, North Carolina.

MILLER, TEXTON R., "Attitudes of Agricultural Education Seniors Toward Adult Education Before and After Student Teaching, 1960-1965," Staff Study, Department of Agricultural Education, N. C. State University, Raleigh, North Carolina.

MILLER, TEXTON R., "Implementing a New Concept of Supervised Practice in Vocational Agriculture — A Pilot Study," Staff Study, Department of Agricultural Education, N. C. State University, Raleigh, North Carolina.

MILLER, TEXTON, R., "Evaluation of Supervised Practice," Center for Research, Development, and Training in Vocational Education, N. C. State University, Raleigh, North Carolina.

NORRIS, MARSENA M., "The Effect of Student Motivation and in Institutional Selection Processes on Area Technical School Student Achievement," Dissertation, Ed. D., Department of Agricultural Education, Oklahoma State University, Stillwater, Oklahoma.

RESEARCH COORDINATING UNIT, "Competencies Needed by Workers in Off-Farm Occupations," Staff Study, Department of Agricultural Education, Mississippi State University, State College, Mississippi.

ROSE, NORMAN H., "A Comparative Study of the Social Participation Role of Vocational and Non-Vocational Teachers, Report for the Center for Occupational Education, Department of Agricultural Education, North Carolina State University, Raleigh, North Carolina.

SHILL, JAMES F., "A Guide for Vocational Agriculture Students With Occupational Objectives in Dairy Farming," Master's Report, Department of Agricultural Education, Louisiana State University, Baton Rouge, Louisiana.

SIMS, LEON A., "Determination of Off-Farm Agricultural Occupations and Needed Competencies," Staff Study, Agricultural Education Section, State Department of Education, Tallahassee, Florida.

SUTTON, ROBERT JAMES, "An Analysis of Occupational Distribution of Vocational Agriculture Students of the Edward Best High School From 1954 Through 1960," Master Problem, Department of Agricultural Education, N. C. State University, Raleigh, North Carolina.

WAKEMAN, T. J., "Time and Motion Study of an Agricultural Research Center," Staff Study, National Research Committee of ASAEAAVT, Cooperative and the Department of Education, Virginia Polytechnic Institute, Blacksburg, Virginia.

WEBB, EARL S., "Identification of Entry Level Into Selected Occupations," Staff Study, Department of Agricultural Education, Texas A&M University, College Station, Texas.

WEBB, EARL S., "Assessment of Characteristics of Students Enrolled in Non-Production Agricultural Programs," Staff Study, Department of Agricultural Education, Texas A&M University, College Station, Texas.

WEBB, EARL S., "Assessment of Attitudes of Local Personnel Toward Vocational Education Programs," Staff Study, Department of Agricultural Education, Texas A&M University, College Station, Texas.

WEBB, EARL S., "Relative Degrees of Difficulty Expressed by Teachers of Vocational Agriculture in Conducting Specified Activities in Supervised Farming Programs in Texas," Staff Study, Department of Agricultural Education, Texas A&M University, College Station, Texas.

ZALATIMO, SULEIMAN D., "A Study of the Availability, Utilization, and Projected Needs of Audio-Visual Aids for Vocational Agriculture Teachers in the Public Schools of Jordan," Dissertation, Ed. D., Department of Agricultural Education, Oklahoma State University, Stillwater, Oklahoma.

"Write directly to the investigator
for information on individual studies."

Vo Ag Valuable to Disadvantaged

Martin McMillion

MARTIN B. McMILLION
Teacher Education
University of Minnesota

and

LLOYD J. PHIPPS
Teacher Education
University of Illinois

Lloyd Phipps

Introduction

Attention of vocational educators was focused on pupils with special needs as a result of the Vocational Education Act of 1963. In order to improve the image of vocational education in agriculture, enrollments in the past have frequently been limited to the pupils who perhaps needed it the least, the more intelligent, the more talented, and the ones originating from the more privileged socio-economic homes in the community. It is now fashionable to give attention to pupils with special needs. In fact, it is mandatory if the spirit of the Vocational Education Act of 1963 is to be implemented. The climate in education is now changing so that the prestige of a vocational education program is enhanced when special programs for disadvantaged pupils are provided.

Vocational educators in agriculture have been experimenting with new programs for pupils with special needs, but progress in this area of responsibility has been too slow. Recently in Illinois an attempt was made to stimulate vocational education in agriculture for pupils with special needs through research relating to communication between teachers and pupils. An attempt was made to determine whether or not teachers of agriculture were able to communicate effectively with pupils with special needs engendered by their socio-economic status. It was assumed that information regarding the communication problems encountered in working with disadvantaged pupils would help teachers learn how to adjust to the teaching of such pupils, and thus motivate the development of additional vocational agriculture programs designed to serve pupils with special needs.

Specifically the study was an attempt to ascertain the degree of understanding and the possible ease of communication between certain classifications of pupils and their teachers of agriculture. The pupils studying vocational agriculture in 21 Illinois high schools were classified into three socio-economic groups at each of the high school grades by the use of the Sims Social Class Identification Occupational Rating Scale. A stratified random sample of 240 pupils composed of twenty pupils from each of the twelve classifications were included in the study. The teacher of agriculture in each of the 21 schools was also included in the study.

The connotations (connotative meanings) the pupils and their teachers placed on eleven words and phrases which are important aspects of the vocational agriculture program were measured by the use of the semantic differential technique.

Instrumentation

The instrument used to measure the connotative meaning of the eleven words and phrases studied was a semantic differential[1] instrument. Such an instrument differentiates connotative meanings of words in terms of certain adjectives which are opposite in meaning. An example of the adjectives are "good" and "bad." A respondent indicated how good or bad a certain word seemed to him by the placement of a check mark on a seven-unit scale. The respondent then described how he felt about the word in terms of other adjectives which were opposite in meaning, such as "pleasant" and "unpleasant" and "important" and "unimportant." The instrument consisted of ten such pairs of adjectives. These adjectives appeared at each end of seven-step scales.

The Words and Phrases Studied

The primary objective of the study was to study individuals rather than to study words. A list of words and phrases were necessary and these words and phrases were selected from those which are important aspects of the vocational agriculture program. The words and phrases used in the study were the following: 1. learning by doing, 2. leadership, 3. cooperation, 4. Future Farmers of America, 5. farming, 6. vocational agriculture, 7. agricultural mechanics instruction, 8. supervised farming program, 9. non-farm agricultural occupation, 10. on-farm instruction, and 11. teacher of agriculture.

Findings

The highest of the three socio-economic groups placed the lowest value on all eleven of the words or phrases used in the study. The middle socio-economic group placed the next lowest value on all the words except "non-farm agricultural occupation" and "co-operation." As the socio-economic level of the pupils increased, the value placed on the words and phrases decreased for nearly all the words used in the study.

(*Continued, page 237*)

[1] The research reported herein was supported by a grant from the U.S. Department of Health, Education, and Welfare, Office of Education. The title of the project was, "A Study in Communication Between High School Teachers of Agriculture and Socio-Economically Disadvantaged Youth by the Use of the Semantic Differential.

[1] Charles E. Osgood, *The Measurement of Meaning*, Urbana, Illinois: University Press, 1957.

NEW EDITING-MANAGING BOARD

More Teachers

The number of NVATA members on the Editing-Managing Board of the *Ag Ed Magazine* were increased to four by unanimous vote of the Board at the meeting in Denver in December. These members are Gerald Page, Nixa, Missouri; Robert Howey, Sycamore, Illinois; Elvin Walker, Norman Park, Georgia; and James Wall, Lincoln, Nebraska.

David R. McClay, Pennsylvania State University, was named chairman, succeeding Orville Thompson, University of California, Davis, who continues as a member of the Board.

George Hurt, Texas State Supervisor, was elected vice-chairman.

Other members of the Board are Ray Agan, Kansas State University; Neville Hunsicker, U.S. Office of Education; R. W. Montgomery, Auburn University; Ralph Woodin, Ohio State University; Thurston Faulkner, State Supervisor, Alabama; and Cayce Scarborough, N.C. State University.

LOOKING OVER THE LATEST AG ED MAGAZINE. Members of the Editing Managing Board and some Special Editors take time out from their business sessions at AVA to pose for this picture. Standing, left to right, they are, Dave McClay, Chairman, Penn State; Ralph Woodin, Ohio State; Carl Humphrey, Supervisor, Missouri; George Hurt, Vice Chairman, Supervisor, Texas; Ray Agan, Kansas State; Gerald Page, NVATA, Missouri; Bob Warmbrod, Editor-Elect, University of Illinois. Seated, left to right, Thurston Faulkner, Business Manager, Supervisor, Alabama; Orville Thompson, Past Chairman, University of California; Cayce Scarborough, Editor, North Carolina State; and Jim Wall, Executive Secretary NVATA, Nebraska.

Flexible Scheduling

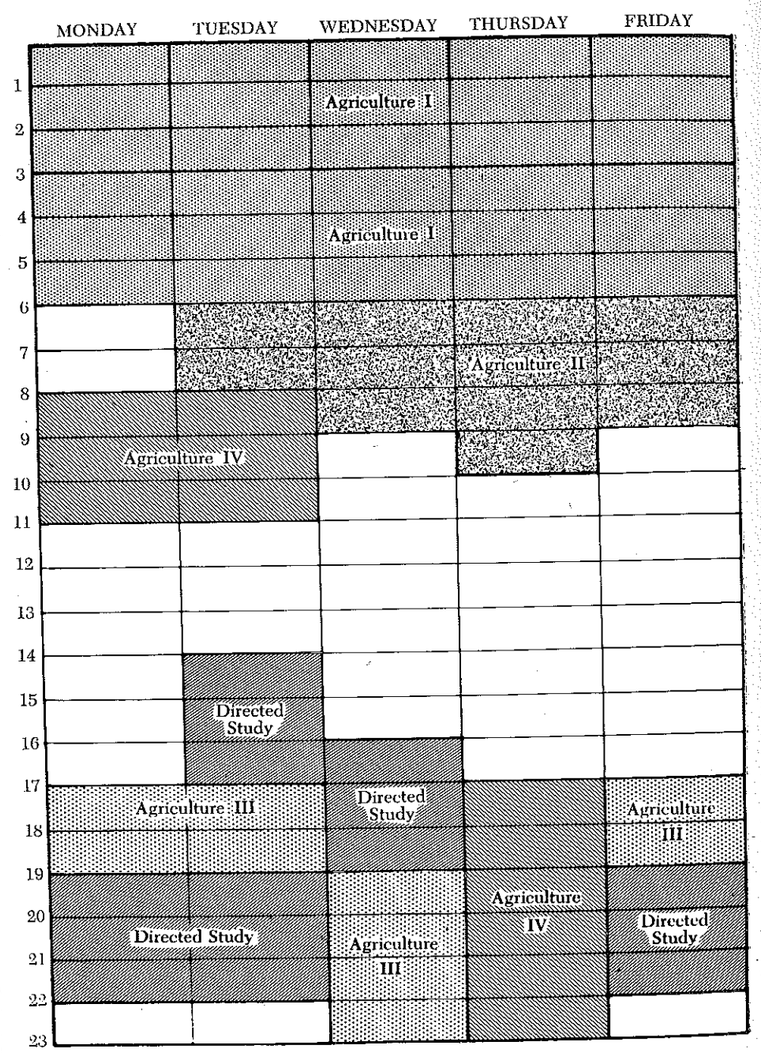
WRIGHT NOEL, Vo Ag Teacher, Bend, Oregon

Two and one half years ago, Bend High School joined five other schools in Oregon and approximately 500 schools in the nation in adopting a scheduling program that many predict will become the standard method of scheduling for all high schools. Commonly called flexible scheduling, this process allows for varying lengths of class time, more flexibility of students use of time, more individual instruction, and more efficient use of facilities. As with all new programs, this one brought with it certain problems and conflicts. However, our school seems to have solved or to have found the means for solving most of the problems.

Fitting Time to Course

Under the flexible scheduling program, each teacher decides on the course time structure that he feels would best fit his course. As can be seen from Figure 1, our agricultural department has decided upon different time allotments and sequences for each of the offerings. This allows the teacher and students to break away from the old-fashioned one hour per day per course that has haunted our educational system for so many years.

After the teachers' time allotments are submitted, the information is fed into IBM computors to be analyzed and evaluated and for all of the courses to be meshed together. As can be imagined, this makes a school-wide master schedule that looks somewhat like a patch-work quilt. It is interesting to note that the scheduling under this system in our 1,000 student high school requires more of the capacity of the Stanford IBM machine than does the entire coordination of the Strategic Air Command. As can be noted in Figure 1 again, we have broken our day into 23, 18 minute periods. Many classes now use a large group-small group type of instruction whereby the students are gathered together in groups of 100 to 250 for a large group lecture which usually lasts for two modules, or 36 minutes. After the lecture, they meet in groups of 10-15 at various times throughout the week to discuss the material presented in the lecture.



Student Schedules

The students are scheduled for approximately four hours in each class per week for formal instruction, plus one hour of directed study. During the directed study time, the students report to a classroom and are under the supervision of the instructor for that course. In this directed study time, they do not receive formal instruction but have an opportunity to do class assignments, research, etc., with the help of their instructor. After a student has demonstrated his ability to discipline himself and to use his time efficiently, he may be released from attending the directed study period, to report only as he feels that he needs help from that instructor. He may now use this time to do his research or study in the library, various resource centers, or to lounge in the cafeteria, which is minimumly supervised.

Due to the fact that the Junior High School is not yet on flexible scheduling and that the ninth graders are transported to the high school for their agricultural classes, the Agriculture I students meet under the traditional system.

The extreme in flexible scheduling may be noted with the Agriculture IV class. To allow for a large block of time for field trips and other extended activities, these students meet for one hour on Monday and Tuesday and six periods on Thursday, plus one hour per student in directed study. This six period allotment has provided for time in the community without necessitating absences from other classes or hurried trips.

Student Responsibility

We are finding that by placing the responsibility of the use of their time upon the students, that they are using their time better and are often motivated to delve in depth into areas of special interest. Our agriculture mechanics facilities are one of the primary areas where this can be noticed. They are being used by students who are not scheduled in for that time but want to construct a project or perfect a special skill.

Our problems have been primarily learning to adapt to a new system. For teachers, we have had to get along with less time for *formal control* of our students. Students have had to assume more initiative and not depend upon the instructors for step by step direction. Students have had some trouble learning to discipline themselves to study rather than socialize in the cafeteria.

While the program has worked very well for the exceptional student, the average and low student have demonstrated a lack of self-discipline sufficient to use the independent study time properly. Steps are now being taken to direct these students slowly toward independence.

The unscheduled time in Figure 1 is used for individual student counseling and teacher preparation. However, teacher preparation seems to suffer since students seem to be in the office continuously. In summary it could be stated that flexible scheduling in our school thus far has helped the good student and the good teacher to become better. Less capable individuals are experiencing difficulties.

While some problems have been found with flexible scheduling, the staff and students are pleased with the results. We are convinced that the problems can be solved, and that students are benefited through the program.

Vo Ag Valuable to Disadvantaged

(*Continued from page 234*)

The connotative meaning of only two of the eleven words showed a significant difference among the socio-economic groups of pupils. The words "leadership" and "cooperation" had a statistically significant difference in meaning for pupils in the different socio-economic groups. Two out of three socio-economic groups of pupils differed significantly (.01 level of significance) from each other concerning the meaning they placed upon the word "leadership." These two groups were the highest and lowest socio-economic groups. The lowest socio-economic groups of pupils placed the highest value upon the word "leadership" and the highest socio-economic group of pupils placed the lowest value upon the word "leadership." The middle socio-economic group of pupils valued "cooperation" significantly higher than did the highest socio-economic group of pupils

A comparison of the connotative meaning for the words between teachers and pupils did not reveal a significant difference in the frequency with which the three socio-economic groups of pupils agreed with the teacher group concerning the connotative meaning of the words and phrases. A striking difference, however, existed in the frequency with which high school pupils by grades agreed with the teacher group concerning the connotative meaning of the words and phrases. Nearly four times as many freshmen and sophomore pupils differed from the teacher group than the junior and senior pupils.

Teachers attempted to predict the connotative meaning their pupils placed on the words used in the study. Predictions made for pupils in the upper high school grades and in the higher socio-economic levels were more accurate than the predictions for pupils at the lower socio-economic levels. The difference in accuracy of prediction among the various pupil groups was not statistically significant. The teachers underestimated to a considerable extent the value which all groups of pupils placed on the words used in the study.

Conclusions

The findings indicate that the socio-economic disadvantaged pupils studied tended to value vocational education in agriculture more highly than the pupils with higher socio-economic status. This finding seems to indicate that special programs for the socio-economic disadvantaged may not be as difficult to organize and conduct as some persons have imagined. The findings of the study indicated further that the communication problem in working with pupils that are socio-economic disadvantaged may not be as great as hypothesized by many educators and others.

The study indicates that teachers of agriculture should not underestimate the desire of socio-economic disadvantaged pupils for vocational education. Also, they should not underestimate their ability to communicate effectively with socio-economic disadvantaged pupils. They should, therefore, consider seriously the offering of special programs in agriculture for the socio-economic disadvantaged pupils in their schools.

Training Needs for the Greenhouse Grower[1]

by
HAROLD BYRAM[2], RICHARD LINDSTROM[3], and WARREN PARSONS[4]

Many teachers of vocational agriculture have or will be broadening their curriculum to include ornamental horticulture and floriculture. They are adding greenhouses and other growing facilities. Many have been confronted with the question of what competencies the greenhouse grower should possess and what they should teach, as well as what plants should be grown by trainees to gain needed competencies. This study was designed to answer some of these questions.

During the last ten years significant changes have occurred in agriculture. One of the major changes has been the increasing number of persons employed in off-farm agricultural occupations.[5] Some of the reasons for this trend include technological developments in the processing and distributing of agricultural products, and urbanization increasing the demand for agricultural goods and services.

One group of off-farm agricultural occupations which will need increasing numbers of agriculturally trained employees is that of ornamental horticulture. Judge estimated that in 1965 there were 4,630 full-time and 2,420 part-time ornamental horticulture workers in the state of Massachusetts. This represented about 22 percent of the total number of off-farm agricultural employees, the largest occupational group of the study.[6]

Ornamental horticulture is increasing in importance because more plants are being used in and outside of homes, around public and private buildings, along city streets and highways, in parks, and in recreational areas.

President Johnson's National Beautification Program has created a critical shortage of plant materials and trained workers for ornamental horticulture. Most of the recent off-farm agricultural occupational studies including the ornamental horticulture occupational family have inquired into the general areas of competencies such as agriculture, business, and mechanics for the various job titles.

The purposes of this study were to determine the nature of the training desired for the commercial greenhouse grower, in terms of the relative importance of the species of ornamental flowering plants produced and of the degree of attainment of competencies needed. The study would also secure employment information relating to greenhouse workers that could be of value in guidance and training such workers.

What Previous Studies Have Shown

A review of studies of off-farm agricultural occupations revealed that ornamental horticulture offered opportunities for employment by the many businesses and employees found in this industry. Most of the studies were preliminary in specific employment information and competencies for specific occupations, and were limited to certain areas within a state. Investigators pointed out occupational opportunities at all levels of employment, requiring the largest number of workers in the semi-skilled category, followed in order by skilled, managerial, supervisory, sales, clerical, technical, and professional employees. Other employment information specifically for ornamental horticulture included: (1) the average minimum and maximum age of entry for all levels of employment was 25 and 51 respectively; (2) the median monthly salaries by level of employment, as between $213 and $677; (3) that most managers desired at least a high school education for entry jobs, while some desire post high school, and others four years of college; (4) and that 21 percent of the managers preferred a farm background

Warren Parsons

for employees but with 75 percent who had no preference in regard to residential background.

Very little employment information, such as the kind sought by the present study, was discovered through studies of the floriculture industry. There was a total of 839 full-time employees and 268 part-time employees in the studies reviewed. Employers expected to hire 154 full-time and 346 part-time employees in the ensuing five years. The total number of employees for floriculture could not be estimated because they were listed under other horticultural job titles. There were no specific kinds of employment information for floriculture, such as minimum age of entry, salary, and union requirements. There were only two general areas of training for floriculture employees found in the review of literature: plant science and agricultural competencies. The total number of greenhouse employees expected in 1969 was 378 full-time and 224 part-time. No occupational studies of the greenhouse industry as such were found in the literature. The only information found was provided as small parts of larger studies of one or more occupational families.

Method Used to Secure Data

A personal interview was conducted with each of the managers of 58 greenhouses out of 64 which covered one acre or more in the Chicago, Cleveland, and Detroit areas.

The data were analyzed by tabulating species of flowering plants grown in pots, as cut flowers, and in flats; the training of the greenhouse grower desired by managers and employment information supplied by them. These data were taken from the data form and total number and/or percentages computed.

[1] Based on a dissertation entitled "An Analysis of Training Needs and Employment Characteristics of the Greenhouse Grower in Three Metropolitan Areas" by Warren Parsons, Ed.D., Michigan State University, East Lansing, 1966).

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[5] Alfred H. Krebs, *Agriculture In Our Lives* (Danville, Illinois: The Interstate, 1964), p. 16.

[6] Homer V. Judge, *Employment Opportunities and Needed Competencies in Off-Farm Agricultural Occupations in Massachusetts* (research report; Boston, Massachusetts: Division of Vocational Education, Massachusetts Department of Education, 1965), p. 10.

Plants Produced

The first purpose of the study was to determine the species of ornamental flowering plants produced in commercial greenhouses, and to note their importance according to the percentage of greenhouse growing major and minor plants in order to provide a better basis for the development of suitable instruction for greenhouse growers. A major crop was defined as any crop producing ten percent or more of the gross income of the business whether grown as pots, cut flowers, or as flats.

Potted Plants

The percentage of managers growing potted plants, either as a major or a minor enterprise, is shown in Table I. Twenty-two other plants were grown by two or four percent of the greenhouses. Only five of these crops (geraniums, chrysanthemums, poinsettias, lilies, and azaleas) were grown in half or more of the greenhouses surveyed. These crops also have the greatest wholesale value in the United States compared to all the species of potted plants included in the survey.

Cut Flowers

In order of plants produced according to a national survey, the number of cut flowers grown in the United States in 1959 was in order, roses, chrysanthemums, carnations, and snapdragons. In this study chrysanthemums were grown in 64 percent of the greenhouses, carnations in 43 percent, and snapdragons in 30 percent. Roses and irises were raised in 12 percent. Roses are considered a crop grown usually by specialists and thereby the percentage of greenhouse companies producing roses is not large in comparison to the total number of roses grown. These five crops were also grown in greenhouses which employed the largest number of workers. Callas, orchids, gladioli, daffodils, delphiniums, stephanotises, sweet peas, and stocks were grown in three to seven percent of the greenhouses. Nine other plants were grown in two percent of the greenhouses.

Flats

Flatted material is sometimes referred to as bedding plants. In certain areas the production of these bedding plants have resulted in the major percentage of the floriculture industry. As an example, the areas around Detroit and Kalamazoo, Michigan are considered major bedding plant areas, and it has been estimated that 2.5 million dollars on the wholesale level are produced here annually. Many of these plants are shipped as far south as the Carolinas and west as far as Missouri.[11] The most popular plants grown in flats were alyssum, petunias, and salvias produced in 32 to 45 percent of the greenhouses. Another group of 14 plants (marigolds, ageratums, zinnias, portulacas, verbenas, impatiens, vegetables, snapdragons, pansies, asters, phlox, coleus, balsams, and delphiniums) was produced in 25 to 29 percent of the greenhouses, and a third group included 6 plants (dahlias, daisies, cosmos, larkspurs, carnations, and begonias (root) were grown in four to 20 percent of the greenhouses. Six other plants were grown in two percent of the greenhouses. There is a correlation between the type of flat grown and the size of the greenhouses. Greenhouse operators who specialized in growing the more popular types of bedding plants were also the larger producers.

Table I. Total Number and Percentage of Greenhouses Growing Major and Minor Potted Plants

Name of Plant	Number Major	Minor	Total	Percentage of Greenhouses Growing
Geraniums	30	11	41	74
Chrysanthemums	25	4	29	52
Poinsettias	24	4	28	50
Lilies	21	7	28	50
Azaleas	18	10	28	50
Hyacinths	9	11	20	36
Hydrangeas	5	13	18	32
Tulips	9	8	17	30
Begonias (root)	2	13	15	27
Begonias (tuberous)	1	14	15	27
Roses	9	5	14	25
Gloxinias	2	11	13	24
Vincas	1	12	13	24
Caladiums	1	11	12	22
Cyclamens	3	8	11	20
Lantanas	1	10	11	20
Foliage plants	6	4	10	18
Daffodils	3	6	9	17
Coleus	3	6	9	17
Impatiens	2	5	7	13
Orchids	4	2	6	11
Ageratums	2	4	6	11
Kalanchoes	1	5	6	11
Petunias	2	3	5	9
Dahlias	1	4	5	9
Rhododendrons	2	2	4	7
Delphiniums	1	3	4	7
Gardenias	0	4	4	7
Carnations	2	1	3	6
Palms	1	2	3	6
Daisies	1	2	3	6
Cacti	1	2	3	6
Pachysandras	0	3	3	5
Stephanotises	0	3	3	5

Competencies Desired

The second purpose of the study was to determine the relative importance and degree of attainment of competencies in the greenhouse grower desired by employers.

Knowledge of fundamental information was included under four content areas of plant science: (1) external plant parts (e.g. root and stem), (2) growth processes, (3) plant names, and (4) anatomical parts (e.g. xylem and phloem) (Table II). At least two-thirds of the managers indicated that knowledge of basic plant parts, basic growth processes, and plant names was essential for the greenhouse grower. In the minds of the operators it was not important to know the various vascular systems in order to grow plants.

The second category of training, called competencies, included those operational abilities such as greenhouse skills needed by the grower to perform the operations involved in his job. The percentage of managers who indicated that competencies were essential, useful, or unneces-

(*Continued*)

Training Needs, Greenhouse Growers
(Continued)

sary for the greenhouse grower is recorded in Table III. Fifty-four percent or more of the greenhouse managers indicated that the following competencies were essential for the greenhouse grower to possess listed in order of importance: (1) watering, (2) controlling pests, (3) fertilizing, (4) mixing soils, (5) potting, (6) transplanting, (7) handling chemicals, (8) cleaning, (9) propagating (10) sterilizing soil, (11) identifying growth containers, (12) applying growth substances, (13) operating boiler, (14) operating equipment, and (15) testing soil.

Table II. Percentage of Managers Who Indicated Knowledge of Basic Fundamental Information Was Essential, Useful, or Unnecessary for the Greenhouse Grower

Knowledge of Fundamental Information	Percent		
	Essential	Useful	Unnecessary
Basic plant parts (e.g. root and stem)	86	13	2
Understanding basic growth processes (e.g. photosynthesis, and transpiration)	75	21	4
Plant names (e.g. scientific and common)	66	27	7
Anatomical parts (e.g. xylem and phloem)	27	59	14

Table III. Percentage of Managers Who Classified Certain Competencies as Essential, Useful, or Unnecessary for the Greenhouse Grower

Competencies	Percentage of Managers		
	Essential	Useful	Unnecessary
Watering	100	0	0
Identifying and control of insects, disease, virus, etc.	98	2	0
Fertilizing	96	2	2
Soil preparation	95	2	3
Potting	93	4	3
How to plant or transplant seedlings	93	0	7
Handling of chemicals	93	7	0
Maintain sanitary conditions	93	7	0
How to propagate (seeds, cuttings, etc.)	89	7	4
Soil sterilization (steam, chemical, etc.)	89	7	4
Identify and use of growing containers	75	21	4
Use of growth substances	66	21	13
Boiler operation	62	36	2
Equipment operating and maintenance	62	32	6
Soil testing	54	43	5

The third category of training considered was various aspects of plant physiology or what might be simply stated as crop understanding. The percentage of managers who indicated that the training of crop understanding was essential, useful, or unnecessary is recorded in Table IV.

At least three-fourths of the greenhouse managers reported that the following areas of training under crop understanding were essential in order of importance: (1) temperature, (2) water requirements, (3) pinching, (4) disbudding, (5) cutting, (6) special cultural practices, (7) humidity, (8) life cycle of plant, (9) grading and packaging, and (10) light effects.

Table IV. Percentage of Managers Who Indicated Training in Crop Understandings was Essential, Useful, or Unnecessary for the Greenhouse Grower

Crop Understanding	Percentage of Managers		
	Essential	Useful	Unnecessary
Temperature	100	0	0
Water requirements	100	0	0
Pinching	93	0	0
Disbudding	91	4	5
Cutting	88	4	8
Special cultural practices (staking, hardening, etc.)	88	9	3
Humidity	82	16	2
Life cycle of plant	82	13	5
Grading and packaging	75	18	7
Light effects	75	9	16

The fourth category of training studied with the greenhouse manager listed the types of management activities.

The percentage of managers who indicated each aspect of greenhouse management training was either essential, useful, or unnecessary for the greenhouse grower is recorded in Table V.

Under the greenhouse management category of training at least 64 percent of the managers indicated that (1) knowledge of labor, (2) analysis of production, and (3) greenhouse layout were essential for the greenhouse grower to understand. At least twenty-seven percent of the greenhouse managers stated that (1) understanding insurance, (2) managing money, (3) buying, (4) selling, and (5) marketing were essential for the greenhouse grower. One must realize that the competencies listed in Table V would be somewhat indicative of the size of the range and the policy of the management. The larger the establishment, the more specialized would be the individual's concern.

The last category of training to which managers were asked to react was the mechanical activities that growers perform.

Twenty-three percent of the greenhouse managers said that skill in plumbing, woodworking, constructing (parts and types), wiring, and welding were essential, while 45 percent indicated that they were useful to know.

There were 152 family and 1,180 part-time or full-time, non-family employees engaged under the various job titles. The number of anticipated new families and non-family employees during 1964-1969 is 162 and 1,358, respectively. The annual employment opportunities for greenhouse workers within the industry sample was 218.

The job title which offered the greatest opportunity for entry was the grower helper, and the job title which offered the most opportunity for advancement was the grower. Advancement from grower helper to manager is possible within the industry.

The majority of managers expressed a desire for greenhouse work experience and at least a high school education for their growers. One-fourth of the managers indicated that the grower should have two years of post-high-school training. Forty-three and 59 percent of the managers indicated that it would be desirable for growers and grower helpers to have farm backgrounds, respectively. The salary range for greenhouse employees varied from 40 to 160 dollars or more per week, with various kinds of fringe benefits for many. Forty percent or less of the employees in different job titles were reported to be members of a union.

Table V. Percentage of Managers Who Indicated Greenhouse Management Training was Essential, Useful, or Unnecessary for the Greenhouse Grower

Greenhouse Management	Percentage of Managers		
	Essential	Useful	Unnecessary
Labor	71	21	8
Greenhouse layout	71	23	6
Analysis of production	64	30	6
Marketing	41	41	18
Selling	36	46	18
Buying	36	50	14
Management of money (budgeting, financing, etc.)	30	54	16
Insurance	27	55	18

Conclusions

1. Commercial greenhouses grew at least 59 different species of ornamental flowering plants which should be considered in developing a program of instruction for the greenhouse grower.

2. Geraniums, chrysanthemums, poinsettias, lilies, and azaleas were grown as a major crop in over half of the greenhouses surveyed, and should be considered when planning instruction for greenhouse growers. Amazon lilies, ivy, and primroses were grown only as a minor crop in two percent of the greenhouses, and therefore, might logically receive less emphasis in a course of instruction for the greenhouse grower.

3. Greenhouse managers wanted the greenhouse grower to have the following competencies: (a) basic plant knowledge including plant parts, growth processes, and plant names; (b) operational abilities including testing soil, operating equipment, operating boiler, applying growth substances, identifying growing containers, sterilizing soil, propagating, cleaning, handling chemicals, transplanting, potting, mixing soils, fertilizing, controlling pests, and watering; (c) crop understanding including light effects, grading and packaging, life cycle of plant, humidity, special cultural practices, cutting, disbudding, pinching, water requirements, and temperature; (d) greenhouse management including knowledge of labor, analysis of production, and greenhouse layout. Therefore, the above competencies should be considered in planning a program of instruction for greenhouse growers.

4. Greenhouse managers desire but do not consider the following competencies essential for the greenhouse grower: (a) the areas of greenhouse management including understanding insurance, managing money, buying, selling, and marketing; (b) mechanical activities including welding, electrical, construction, woodwork, and plumbing.

5. There are employment opportunities to enter as a greenhouse grower helper in the greenhouse industry.

6. A greenhouse grower helper may advance to a greenhouse grower or a managerial position in the greenhouse industry.

7. Greenhouse managers desire at least a high school education and practical work experiences for their growers.

H. B. Tukey, Sr., *The Role of Horticulture in Science and Society*, Proceedings XVIth, Volume II (Brussels, Belgium: International Horticultural Congress, 1962), pp. 3-14.

Raymond M. Clark, "Need for Training for Non-Farm Agricultural Business" (East Lansing, Michigan: Department of Teacher Education, Michigan State University, 1959); William Henry Kennedy, "A Clarification of Relationships Between Farming and Certain Other Agricultural Occupations with Implications for Guidance and Curriculum Development" (unpublished Ed.D. Dissertation, Michigan State University, East Lansing, 1958).

Hoover, McClay, and Stevens, *op. cit.*, p. 7.

United States Office of Education, *Summaries of Studies in Agricultural Education*, Vocational Education Bulletin 180, Washington, D. C., 1963).

Paul R. Krone, Richard Lindstrom, and others "Floriculture in Michigan" "Project '80—Rural Michigan Now and in 1980" (Michigan Extension Office, Michigan State University, East Lansing, Michigan, June 1966), p. 7.

Stories in Pictures

GILBERT S. GUITER
Ohio State University

NVATA President Jim Durkee passes the gavel to newly elected President - Elvin Walker of Norman Park, Georgia

Past President of NVATA - Sam Stenzel of Russell, Kansas, gives the officer installation ceremony as newly elected NVATA President - Elvin Walker and President Jim Durkee of Laramie, Wyoming look on.

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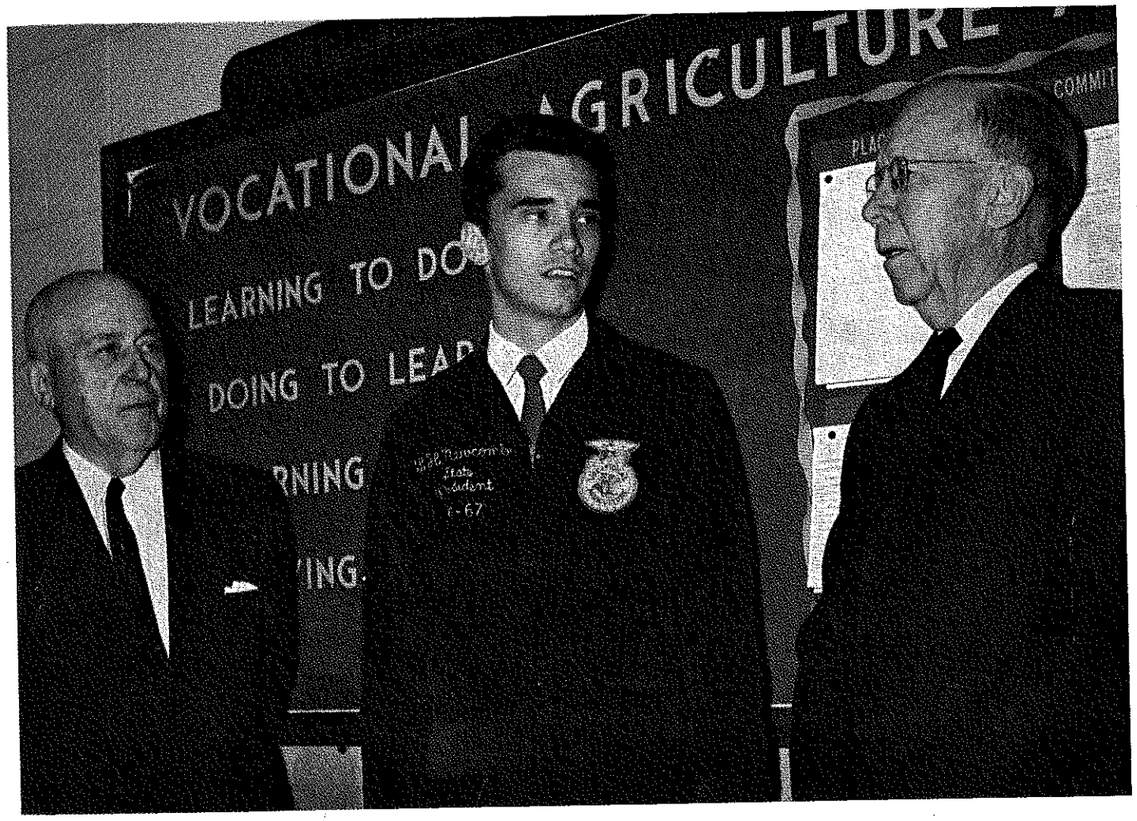

L. H. Newcomb, President, Virginia Association FFA, discusses the early history of the FFA Organization with Dr. Walter S. Newman, President Emeritus, V.I.P., and Harry W. Sanders, Professor Emeritus, Vocational Education, V.I.P. During a conference in September 1925, Doctor Newman, then State Supervisor of Agricultural Education in Virginia, proposed to the teacher training staff at V.P.I. that boys studying vocational agriculture should have their own organization — now the FFA. Present at the conference were Walter S. Newman, H. W. Sanders, Edmund C. Magill, and Henry C. Groseclose. Mr. Magill and Mr. Groseclose are deceased.

Featuring FFA — For 1928 or 1968?

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