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DEPARTMENT OF THE INTERIOR

BUREAU OF EDUCATION

WASHINGTON

REPORT OF PROGRESS OF THE SUBCOMMITTEE ON COLLEGE INSTRUCTION IN AGRICULTURE.

APRIL 15, 1920.

EXPLANATORY NOTE.

Early in January, 1919, Dr. P. P. Claxton, United States Commissioner of Education, invited the following persons, representing the several phases of agricultural education, to attend an informal conference in his office on January 31 and February 1, for the purpose of advising him concerning a program of agricultural instruction to meet present needs:

L. H. Bailey, Ithaca, N. Y.
G. I. Christie, Purdue University, Lafayette, Ind.
Eugene Davenport,[1] University of Illinois, Urbana, Ill.
Kary C. Davis, George Peabody College for Teachers, Nashville, Tenn.
L. S. Hawkins, Federal Board for Vocational Education, Washington, D. C.
C. D. Jarvis, U. S. Bureau of Education, Washington, D. C.
H. A. Morgan,[1] University of Tennessee, Knoxville, Tenn.
R. A. Pearson,[1] Iowa State College, Ames, Iowa.
Alfred Vivian,[1] Ohio State University, Columbus, Ohio.
Guy M. Wilson, Iowa State College, Ames, Iowa.
A. F. Woods, Maryland State College, College Park, Md.
George A. Works, Cornell University, Ithaca, N. Y.

This group was organized for continued service as the Bureau of Education's Advisory Committee on Agricultural Education. At the initial meeting it was decided to extend the membership to include the following persons:

Otis W. Caldwell, Columbia University, New York, N. Y.
D. J. Crosby, Cornell University, Ithaca, N. Y.
H. W. Foght,[2] U. S. Bureau of Education, Washington, D. C.
H. L. Kent, Kansas State Department of Education, Topeka, Kans.
A. C. True, U. S. Department of Agriculture, Washington, D. C.
H. J. Waters, Kansas City Star, Kansas City, Mo.

The members of the committee were unanimous in the belief that there was a real need for the coordination of effort in the development of a program of agricultural education. It was found that a number of individuals and committees were studying independently various phases of the subject. Owing to a fortunate overlapping of personnel, it has been possible on the part of this committee to utilize the results of these studies and to serve as a clearing-house of ideas in the field of agricultural education.

[1] Unable to attend the initial meeting.
[2] Now with the Northern Normal and Industrial School, Aberdeen, S. Dak.

It was early recognized that the agricultural education problem embraces three quite distinct phases, as follows:

1. The reorganization of the curriculum, including provision for closer articulation.

2. The special preparation of teachers to meet the demands of the reorganized curriculum.

3. Appropriate organization and adequate support to meet the needs of the revised program of agricultural education.

It was decided to limit attention, for the present, to the first item—the reorganization of the curriculum. For convenience, the instructional program was divided into three parts, following the common method of dividing the field, namely, (*a*) elementary agriculture, (*b*) secondary agriculture, (*c*) collegiate agriculture.

In harmony with this plan the members of the committee grouped themselves into three corresponding subcommittees according to their special interests. The subcommittee on collegiate agriculture, which is responsible for the present report, comprises Messrs. True (chairman), Crosby, Davenport, Morgan, Wilson, Woods, Works, and Jarvis. This subcommittee held a second meeting in Washington on March 7 and 8, 1919, and a third in Chicago on the occasion of the annual meeting of the Association of Land Grant Colleges, November 12–14, 1919.

The inquiry involved considerable personal visitation of the colleges on the part of the subcommittee. The major part of such work, however, as well as that pertaining to the preparation of the report, was performed by Dr. True and Prof. Crosby.

The other members were engaged in the field work to a more limited extent, and all reviewed the report.

It is believed that the findings of the committee will be of immediate assistance to college faculties and administrative officers in adjusting their curricula to meet present needs, but the chief purpose in publishing this preliminary report is to stimulate discussion on the several points raised. The Bureau of Education, therefore, will be glad to receive, either directly or through the committee, suggestions and criticisms concerning any phase of the problem.

C. D. Jarvis,
Specialist in Agricultural Education,
United States Bureau of Education.

REPORT OF PROGRESS OF THE SUBCOMMITTEE.

The subcommittee on college instruction in agriculture decided to confine its work to studies of some of the problems of the four-year curriculum for agricultural students. Instead of sending out a questionnaire to all the agricultural colleges, representatives of the committee visited the colleges in the following States: Alabama, California, Georgia, Illinois, Iowa, Kansas, Maryland, Michigan, Minnesota, Mississippi, Missouri, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, Tennessee, and Texas. Conferences were held with deans and members of the faculties individually and collectively and in some cases with groups of students. The following report of progress embodies the general results of the inquiries thus far made:

1. It was discovered that practically all the colleges were more or less actively considering problems of their curriculum, through special faculty committees or otherwise. Modifications of the curriculum had either been recently adopted or were under consideration; entrance requirements were either changed or being seriously scrutinized; readjustments of the elective system were being made or discussed. There was also a general purpose to improve the quality of college teaching and the equipment for this work. This movement was being affected by various influences. Among these were: (1) A desire to make sure that the institution would be fully of standard college grade; (2) to train students to meet more practically and fully the requirements of the particular pursuits for which they were preparing; (3) to meet new conditions in the secondary schools, especially those due to the introduction there of vocational studies, in order that the college might improve and strengthen its relations with the preparatory schools; (4) to take into account the new pedagogical theories relating to the mental fitness of students to pursue college courses, the educational value of different studies as related to the objective of the student, the problem method of instruction, as related to the logical method, etc,; (5) the scope of limitations of practicums, field practice, visual instruction, lectures, textbooks, etc.; (6) new views of educators regarding the development of instruction in the fundamental and related sciences out of courses

in practical agriculture so constituted as to create a desire in the student to know underlying facts and principles and to lead him on to studies of the sciences, rather than by beginning with sciences and basing instruction in agriculture on the scientific facts and principles previously acquired by the student; (7) the broadening of the agricultural curriculum to include not only agricultural production but also rural economics and sociology, and, for certain students, pedagogical training.

2. The colleges were asked to comment on the objectives of the agricultural colleges, which were stated as follows:

(*a*) The general aim of the agricultural college should be to prepare students *to live in a rural community and work in agriculture or to work in the interests of agriculture and rural life, wherever they might live.*

(*b*) The particular objectives of the individual college will vary with its environment, clientage, and resources, but may include training for the following pursuits in the agricultural field:

1. General or mixed farming.
2. Special farming, such as seed growing, truck growing, orchard management, greenhouse management, animal breeding (beef cattle, hogs, horses, etc.), dairy production, poultry production.
3. Teaching in colleges or schools, extension work, county agent work, journalism.
4. Research, as experiment-station work.
5. Administrative and regulatory work.

The colleges generally accepted this statement of objectives as representing very well their view of this matter. In California it was suggested that the training of specialists in agricultural chemistry, entomology, plant and animal pathology, and other sciences related to agriculture should be included in the objectives of the agricultural college whether students in those branches intended to engage in agricultural work or not.

3. In order to give the student early in his course a good understanding of what is involved in education for agriculture and rural life and prepare him to choose and pursue intelligently his course later on—

Should the college offer general basic courses to include what the general farmer needs to know in order to carry forward his work intelligently and successfully?

If such courses are offered, how should they be organized?

What departments should be represented in such courses?

For a long time there has been contention in agricultural faculties between those believing in considerable instruction in the fundamental sciences before the student takes up work in agricultural subjects and those holding that the student should become acquainted with agricultural subjects early in his course in order to arouse and stimulate his interest in agriculture and lead him to relate the agricultural subjects more definitely and usefully with the knowledge derived from a study of the sciences related to agriculture. Experience in what may be called experiments to test theories and the general trend of pedagogical thought toward the advisability of using concrete things and the practical knowledge of the student as an introduction to his study of the abstract and theoretical, have brought about a gradual evolution in the curricula of most of our agricultural colleges, which in its present stage shows a practical compromise between these two theories.

In most colleges the teaching of some agriculture has been brought down to freshman year, and during the first two years a considerable amount of instruction in the main branches of plant and animal production is required of all agricultural students. During the same period courses in several of the sciences run parallel with those in agriculture.

One strong incentive for such an arrangement of the curriculum has been the fact that large numbers of the agricultural students have been unwilling or unable to remain in college more than one or two years and often would not have entered the college unless they could immediately pursue agricultural subjects. To such students the study of the sciences is felt to be entirely subsidiary to the study of agriculture, since they have no intention of becoming agricultural scientists.

Another element is now being brought into this situation from the increasing spread of agricultural instruction in the secondary schools, a movement greatly stimulated by the passage of the Smith-Hughes Vocational Education Act. The colleges in a number of States have already felt compelled to recognize this movement by offering a certain amount of entrance credit for agriculture when properly taught in secondary schools. There are also the beginnings of unrest on the part of students who have taken agriculture in the secondary schools when they are required in college courses to pursue the same elementary courses in agriculture as are given to students who have had no instruction in agriculture before coming to college.

The agricultural courses in the secondary schools as a rule constitute a somewhat general survey of the factors of agricultural production and some very elementary matters which relate to farm management and other phases of rural economics, together

with a certain amount of farm practice through home projects, judging exercises, etc. They may also include a superficial introduction to the relations of the sciences to agriculture. Such courses are, therefore, in the nature of elementary basic courses giving the student some conception of the content of agriculture and preparing him in some degree to appreciate the importance of further study of agricultural subjects as they may be developed in the college curriculum.

There was quite general agreement in the colleges visited to the proposition that during the first two years in college students should be required to take general basic courses, which should include what the general farmer needs to know in order to carry forward his work intelligently and successfully. The only objection to this plan came from men who had not tried it and who thought that such courses would savor of "short-course work" and would necessarily contain much that would need to be repeated later in more technical courses. By some it was thought that there would be less need for such courses in the case of students who are reasonably sure of completing the four-year course. Most of the colleges visited are already committed to this plan.

As to the organization of basic courses and the time to be devoted to them there is less general agreement. A few confuse them with basic related science courses, like chemistry and genetics; others would offer three or four very general courses, like plant life and animal life; but the larger number would have each agricultural department offer a general basic course. Following this plan, some institutions would give courses in agronomy, animal husbandry, horticulture, and farm mechanics, while others would subdivide each of these. The subjects most frequently offered or suggested by those furnishing written plans were the following: Soils, farm crops, animal husbandry, dairying, horticulture, farm mechanics, and poultry husbandry. Some of the other subjects offered as basic courses are: Plant life, plant propagation, genetics, farm motors, farm carpentry, forging, and vegetable gardening.

In some institutions a survey course or finding course has been developed for freshmen to help them orient themselves. In one college this is popularly known as "the dean's course," since the dean of agriculture has charge of it and calls in representatives of agricultural departments to give one or two lectures each, the purpose being to acquaint freshmen with the personnel and the work of the various departments. Such courses are usually required.

Of late, basic courses in agriculture have come to have added significance and importance in connection with the training of teachers of agriculture for secondary schools and extension workers in gen-

eral agricultural lines, who need broad general training in agriculture rather than specialization in one or two phases of the subject. Those in charge of teacher-training work in the agricultural colleges are quite generally agreed that basic courses in agronomy, animal husbandry, rural engineering, and rural economics are essential to best results in their field. They point out that where basic courses are lacking it is sometimes necessary for a student to take 12 to 15 semester hours in a department in order to get even a superficial view of its subject matter, and that when the work of six or seven departments is so organized it is manifestly impossible for prospective teachers to get the kind of training they need.

The plan now generally followed of having basic courses in each of a considerable number of departments and spreading those courses over two years does not fully meet the need of the student who has not had a good course in agriculture in the secondary school to get a fairly good view of the general content of agriculture quite early in his course. This difficulty may perhaps be largely removed by having the basic courses in soils, crops, and animal husbandry somewhat broadly drawn and required in freshman year.

An example of a course in crops framed on this plan is that given to freshmen at the Illinois College by Prof. Burlison. This course is based on the discussion of a few type crops, including cereals, legumes, and potatoes. Among the subjects treated are preparation of the seed bed, seed selection, judging, grading, improvement of varieties, weeds, insects, diseases, harvesting, storing, marketing, and cost of production.

These basic courses, together with the elementary courses in the more specialized subjects, such as horticulture, poultry, rural engineering, etc., might be spread over freshman and sophomore years. In this way a sufficient basis of general instruction in agriculture would be laid on which to build specialization through group courses beginning in junior year.

4. As regards required courses, group courses, and free electives, there is a great variety of arrangements in the curricula of the colleges. In general, however, the colleges considerably limit the student in the choice of his studies. There is also a general tendency toward a group elective system. Under this system the student is required at a certain period in his course to decide on the subject to which he will give his major attention. In the case of the agricultural student this is usually one of the main divisions of agriculture, as agronomy, horticulture, animal husbandry, dairying, agricultural engineering, or rural economics. He is then offered a schedule of studies in which his chosen subject has a very large part, but is combined with a considerable amount of other required studies, some of

which are related to it, while others are for the purpose of giving him a more liberal education. There are also a number of electives, some of them within his chosen subject and others entirely outside of it. The former may be arranged with reference to specialization on some branch of his major subject. Thus the agronomy group may permit specialization on crops or soils; the horticulture group on pomology, vegetable growing, or landscape gardening; the animal husbandry group on beef cattle, hogs, sheep, horses, etc.

The time in the curriculum when the student is permitted to choose his major subject is thus far determined very largely by considerations affecting the individual college. There is, however, quite general agreement that, when the college curriculum is based on standard entrance requirements of at least 14 units, specialization in agriculture should not begin until junior year. The students consulted generally agreed that this is the best time.

A few colleges are not yet ready to raise their entrance requirements to the standard level, because the public-school system of their States does not give the rural youth opportunity to prepare properly for college. These colleges feel that for the present it is best to make their agricultural courses largely required courses for all students, confining electives chiefly to senior year.

In Iowa the agricultural faculty believes that experience covering many years shows that boys coming from Iowa farms can get all the general agriculture they need during freshman year and are qualified to choose their major subject at the beginning of the sophomore year. Many students come to this college with their minds made up to pursue a certain course. This has been more so since a considerable number of graduates are established on Iowa farms, and particularly since extension agents have been located in the Iowa counties and a considerable number of high schools have introduced courses in agriculture. Iowa boys thus have perhaps an unusual opportunity to consult with persons qualified to advise them regarding the course of study which it is best for them to pursue in college.

The Illinois College has thus far favored a general course in agriculture without group electives for most students on the ground that this would give the best preparation for agricultural practice, teaching, or extension work. There is, however, now a tendency to adopt a limited group system, and this has actually been provided in farm organization and management, floriculture, and landscape gardening.

Colleges having the group system quite generally have some plan by which students can get advice from the faculty regarding the choice of their curriculum. Often the adviser is the head of the department in which the student is thinking of majoring. There is, however, evidence that this matter has not been very thoroughly

or satisfactorily worked out by the colleges. The reasons which students consulted gave for choosing their major indicate that even at the beginning of junior year many students are doubtful what it is best for them to do and that oftentimes their choice is determined largely by the popularity or influence of the faculty member consulted or by the advice of upper-class men.

5. There is considerable difference of opinion as to whether professional courses for training teachers should be given as undergraduate work. Practically, however, it seems necessary at present that this should be done to fit teachers of agriculture for the Smith-Hughes and other secondary schools. Many teachers now in these schools are without professional training and have not taken college courses in agriculture.

It is highly desirable that such teachers be well grounded in the theory and practice of agriculture as taught in the colleges. That this may be done it is necessary for them to take a relatively large amount of agriculture during their undergraduate course. They will therefore have an opportunity for only a limited training in pedagogical subjects unless they pursue postgraduate studies. The same general considerations apply to students intending to become extension workers or agricultural journalists. Thus far very few colleges have given courses with special reference to their needs, though such courses seem very desirable.

There is general agreement that agricultural investigators should pursue graduate studies. Whatever specialties they ultimately intend to pursue, they should have a broad general acquaintance with agriculture, a thorough training in fundamental sciences, and a good reading knowledge of two or more modern languages. We should look forward to the time when a doctor's degree will be a prerequisite to permanent employment on the experiment station staff. Advanced students may, however, get a part of their training by being employed as assistants in station work.

6. Since the agricultural student usually specializes in a considerable degree during at least the second half of his college course, and has little, if any, opportunity to apply what he has learned to the actual problems of agriculture and country life until after his graduation, it has seemed to many observers of the graduates of our agricultural colleges that they are not very well prepared to meet the conditions they find on the farm and in rural communities as soon as they enter on active careers there. In other words, they have not considered the agricultural problem as a whole and learned how the various things they have been taught in colleges are related to the various factors in this problem.

Taking into account this situation, the committee raised the question at the colleges visited whether it would be desirable and prac-

ticable to give the student during his senior year an advanced general course in which the effort would be to present the production, economic, and social problems of agriculture as a connected whole and have the student consider how what he had learned in his previous studies could be brought to bear on these problems. He might also be shown what are the problems which he will have to face when he gets into active life, particularly as a citizen and farmer or teacher or extension worker in a rural community.

It was evident that the problems connected with the giving of such an advanced general course in agriculture had not received much, if any, attention in most of the colleges visited. When the matter was presented it made a strong appeal to many members of the agricultural faculties, but naturally there was much difference of opinion as to its feasibility or how it might be organized and taught. Where institutions had departments of farm management, rural economics, or sociology, it was often the opinion that such a course might best be given in these departments. There were, however, objections to this because the instructors in such departments do not always have broad enough training or experience in agricultural science and practice. In many colleges these departments are yet relatively weak. The instructors have either taken up agricultural economics or sociology as a branch of general economics or sociology, without having pursued college courses in agriculture, or being graduates of agricultural colleges have undertaken instruction in these branches without thorough training in economics or sociology.

It would therefore seem preferable that this advanced general course should be given by persons of broad experience in dealing with the problems of agricultural education as related directly to farming and country life. Persons qualified by their experience and outlook to do this work are rare. In a few institutions the dean or some other general officer has made attempts to give such a course in at least a partial way, but they have found it difficult to find time either to prepare or give a course satisfactory to themselves or the students. The importance of the matter seems to justify further consideration and experimentation in the hope of solving this question.

7. It seems evident that the agricultural faculties generally have not given to the college curriculum the broad consideration which it deserves. The subject of agriculture has been developed by subdivisions and increasing specialization. This process has not yet run its full course. The major emphasis has so far been laid on agricultural production and the subjects included in rural economics and sociology have not yet been amply organized and specialized. Meanwhile, with the constant addition of specialists to the faculty, the curriculum has been considered more with reference to meeting the

claims of these specialists and facilitating the offering and scheduling of numerous special courses rather than with reference to the needs of the students and the adjustment of the curriculum to the agricultural problem as a whole.

8. Many of our agricultural colleges now have a relatively large number of students. They are also engaged in research and extension work, as well as teaching. Many forms of public service are required of these institutions. The deans and even the heads of departments do not have the time or opportunity to give sufficient attention to the problems of teaching as related to the curriculum, the qualifications of teachers, and the needs of the students. It is therefore increasingly apparent that there should be in the organization of these colleges a general officer, subordinate to the dean, who would act as a supervisor of teaching and be of coordinate rank with the directors of the experiment station and extension work. A few institutions have already moved in this direction. Sometimes this has been done by giving the head of some department general advisory or supervisory duties with reference to the general problems of teaching. In California recently a director of teaching has been temporarily employed, but with the thought that this office might be rotated among different departments, its personnel changing annually. These arrangements are necessarily makeshifts or experiments. It would seem that already in many institutions there is plenty of work to occupy the time and energy of a director of teaching, and that he should be a permanent officer.

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