

in all cases. The author wishes to thank Meyer M. Harris for the routine analyses.

TABLE I
Averages of the Production of Acid by Bacillus coli communis

| Length of Storage in Weeks | Dextrose | Lactose | Maltose | Saccharose | Man-nite | Raffinose | Salicin |
|----------------------------|-------------------|---------|---------|------------------|----------|------------------|---------|
| 0 | 2.71 ¹ | 2.02 | 2.15 | No acid produced | 2.87 | No acid produced | 1.83 |
| 1 | 2.73 | 2.12 | 2.01 | | 2.88 | | 1.73 |
| 2 | 2.71 | 2.09 | 2.01 | | 2.82 | | 1.69 |
| 3 | 2.79 | 1.77 | 2.00 | | 2.36 | | 1.54 |
| 4 | 2.78 | 1.81 | 2.03 | | 2.34 | | 1.52 |
| 6 | 2.76 | 1.78 | 2.11 | | 2.35 | | 1.54 |
| 8 | 2.44 | 1.88 | 1.81 | | 2.34 | | 1.49 |
| 10 | 2.39 | 1.84 | 1.78 | | 2.17 | | 1.38 |
| 14 | 2.41 | 1.98 | 1.77 | | 2.09 | | 1.39 |

TABLE II
Averages of the Production of Acid by Bacillus coli aerogenes

| Length of Storage in Weeks | Dextrose | Lactose | Maltose | Saccharose | Man-nite | Raffinose | Salicin |
|----------------------------|-------------------|---------|---------|------------|----------|-----------|------------------|
| 0 | 2.76 ² | 1.95 | 1.97 | 2.08 | 2.63 | 2.03 | No acid produced |
| 1 | 2.80 | 2.22 | 2.09 | 2.64 | 2.62 | 1.48 | |
| 2 | 2.77 | 2.09 | 2.16 | 2.66 | 2.49 | 1.53 | |
| 3 | 2.81 | 2.05 | 2.03 | 2.17 | 2.34 | 1.68 | |
| 4 | 2.75 | 1.86 | 1.96 | 1.90 | 2.30 | 1.61 | |
| 6 | 2.78 | 1.75 | 2.03 | 1.94 | 2.29 | 1.58 | |
| 8 | 2.47 | 1.76 | 2.03 | 1.95 | 2.32 | 1.60 | |
| 10 | 2.34 | 1.77 | 1.79 | 1.82 | 2.16 | 1.59 | |
| 14 | 2.27 | 1.80 | 1.81 | 1.77 | 2.13 | 1.58 | |

TABLE III
Averages of the Production of Acid by Bacillus coli acidi lactici

| Length of Storage in Weeks | Dextrose | Lactose | Maltose | Saccharose | Man-nite | Raffinose | Salicin |
|----------------------------|-------------------|---------|---------|------------------|----------|------------------|---------|
| 0 | lost | 1.96 | 2.46 | No acid produced | 2.82 | No acid produced | 1.65 |
| 1 | 2.80 ³ | 2.00 | 2.14 | | 2.62 | | 1.19 |
| 2 | 2.81 | 2.00 | 2.15 | | 2.69 | | 1.46 |
| 3 | 2.76 | 1.81 | 2.24 | | 2.39 | | 1.44 |
| 4 | 2.74 | 1.83 | 2.20 | | 2.29 | | 1.39 |
| 6 | 2.76 | 1.91 | 2.29 | | 2.32 | | 1.38 |
| 8 | 2.22 | 1.83 | 2.15 | | 2.27 | | 1.42 |
| 10 | 2.06 | 1.85 | 1.89 | | 2.23 | | 1.33 |
| 14 | 2.05 | 1.82 | 1.86 | | 2.16 | | 1.34 |

¹ Each result is the average of ten titrations.

² Each result is an average of ten titrations.

³ Each result is an average of ten titrations.

Conclusion

From the tables of averages it may be seen that storage for a period of 14 weeks in sterilized Hudson River water (in tidal area) has very little effect upon the amount of acid produced in dextrose, lactose, saccharose, maltose, mannite, salicin and raffinose by various members of the *Bacillus coli* group, *i. e.*, *Bacillus coli communis*, *aerogenes* and *acidi lactici*, which indicates that production of acid is a permanent characteristic of the *Bacillus coli* group. The slight decline of acid production may be due to diminished vitality of the organisms as a result of long storage in the water.

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THE WASHINGTON MEETINGS OF THE ASSOCIATION OF AMERICAN AGRICULTURAL COLLEGES AND EXPERIMENT STATIONS AND RELATED ORGANIZATIONS

THE twenty-eighth annual convention of the Association of American Agricultural Colleges and Experiment Stations, held at Washington, D. C., November 11-13, 1914, and accompanied as usual by meetings of about half a score of related organizations, brought together college presidents, experiment station and extension directors, and workers in many fields of agricultural science to the number of approximately five hundred. The sessions of the various bodies were well attended and enthusiastic, and the programs included much of interest to educators, scientific men and the general public.

The complete list of organizations included in these meetings was as follows: American Association of Farmers' Institute Workers, November 9-11; American Farm Management Association, November 9, 10; American Society of Agronomy, November 9, 10; National Association of State Universities, November 9, 10; American Association for the Advancement of Agricultural Teaching, November 10; Society for the Promotion of Agricultural Science, November 10; American Society of Animal Production, November 10,

11; Land-grant Engineering Association, November 11-13; Association of Official Seed Analysts, November 12, 13; Association of Feed Control Officials of the United States, November 13, 14, and Association of Official Agricultural Chemists, November 16-18.

The general sessions of the Association of American Agricultural Colleges and Experiment Stations opened November 10. In an address of greeting, the Secretary of Agriculture, Hon. D. F. Houston, spoke of the increasing realization of the unity of interests of the department and the agricultural colleges, and of the widened opportunities for service through this and through the passage of the Smith-Lever extension act. He also emphasized the additional responsibilities incurred, and especially the difficulty of securing trained men to take up these new undertakings. The development of strong rural economics courses to provide workers in such lines as marketing studies and the making of country life more attractive was strongly urged upon the agricultural colleges as well as their assumption of a general position of leadership in country life matters.

In the report of the bibliographer, Dr. A. C. True, of the Office of Experiment Stations, discussed the form of extension publications, calling attention to the great diversity of practise now prevailing, and suggesting some changes in the interests of uniformity, increased availability, and ease of preservation of these publications. Subsequently, a series of recommendations from the agricultural libraries section of the American Library Association as to title pages, pagination and similar matters in college and station publications in general received the consideration and approval of the executive committee of the association.

For the standing committee on instruction in agriculture, Dr. True reported as chairman on farm practise requirements as a part of the 4-year college course. Much diversity among institutions was discovered but the importance of the subject was strongly emphasized. It was pointed out that failure to make provision for such practise decreases the effective-

ness of instruction in agriculture, and that students who are permitted to graduate without it often bring upon the colleges merited unfavorable criticism. The report is to be printed as a separate at an early date.

Dr. H. P. Armsby, of Pennsylvania, reported for the committee on graduate study, dealing especially with the Sixth Graduate School of Agriculture successfully held at the University of Missouri, June 29 to July 24. A policy of concentration upon a few subjects at the school was favored as well as the provision of some form of credit for work accomplished, and the need of greater attention by the colleges and stations to ways for facilitating the attendance of the younger members of their staffs at this school was pointed out.

Reports were also submitted by the standing committees on college, experiment station and extension organization and policy. A plan for student and faculty cooperation being tried at the Iowa State College in such matters as the upkeep of the grounds, sanitation and other minor improvements, and the protection of property was briefly reported by the college committee. This committee also summarized a questionnaire as to student character records which indicated a general belief in the desirability of such records but little uniformity as to methods. The experiment station committee emphasized the need for a sharp differentiation of the field of the station work from that of extension agencies, limiting the scope of the station to the discovery of new facts and methods and the testing of them to a point sufficient to establish their general truth and application. The prompt publication of results and the preservation of records in such form that in case of necessity the work may be taken up by others and the wider utilization of the *Journal of Agricultural Research* were also recommended. The report of the extension committee consisted largely of descriptions and definitions of terms commonly used in extension work. The question of general agricultural terminology is also to receive further study by a special committee subsequently authorized by the association.

The joint committee of the association and the U. S. Department of Agriculture on projects and correlation reported through Dean F. B. Mumford, of Missouri, that the committee had examined about 1,300 projects submitted by the state institutions and about 1,000 from the Department of Agriculture with a view to their possible correlation. Dr. K. F. Kellerman, of the department, for the joint committee on publication and research, explained the policies of the *Journal of Agricultural Research*, now open to experiment station workers, and urged a wider participation by them.

The evening sessions of the association were devoted largely to the address of the president, Dr. A. C. True (already printed in SCIENCE) and to addresses by E. L. Morgan, of Massachusetts, and Miss Elizabeth B. Kelley, of Wisconsin. Professor Morgan described an interesting experiment in rural community planning inaugurated in a typical New England village by the Massachusetts Agricultural College, whereby a strong community spirit was developed and great improvement effected in agricultural practise and marketing, transportation facilities and other civic affairs, in education, and in the adoption of an all-the-year-round plan for community recreation. Miss Kelley spoke on home economics in extension work and emphasized the importance of educating men as well as women along this line, outlining some of the ways which have been found effective in bringing improved methods into the home.

One of the general sessions was set aside for the discussion of problems in connection with the administration of the Smith-Lever extension act. At this session, President W. O. Thompson, of Ohio, chairman of the executive committee, reviewed the passage of the measure and Dr. True, for the States Relations Committee of the U. S. Department of Agriculture, described its practical workings. The matter was further discussed by Dean C. F. Curtiss, of Iowa, President A. M. Soule, of Georgia, A. D. Wilson, of Minnesota, President Benjamin Ide Wheeler, of California, and others. Hon. Carl Vrooman, Assistant Secretary of Agriculture, also made a brief address

at this session in which he pointed out the need of extension work. At its close the association was received at the White House by President Wilson.

At the final session, a report was made by President Brown Ayres, of Tennessee, for the executive committee, on the provisions and status of the Smith-Hughes bill for federal aid to vocational education, including an explanation of the work of the Federal Commission on Vocational Education. Commissioner Claxton and others also discussed the scope and details of the bill. The association declared itself in favor of federal aid to vocational education along the general lines of the bill and instructed the executive committee to cooperate with other agencies in perfecting the measure and aiding in its passage.

Various measures relative to military instruction in the land-grant colleges were referred to the executive committee for consideration. An engineering division was established in the college sectional meeting with provision for either separate or joint programs.

Officers for the ensuing year were chosen as follows: President, E. A. Bryan, of Washington; Vice-presidents, J. H. Worst, of North Dakota, T. F. Hunt, of California, C. D. Woods, of Maine, P. H. Rolfs, of Florida, and C. A. Lory, of Colorado; Secretary-treasurer, J. L. Hills, of Vermont; Bibliographer, A. C. True, of Washington, D. C.; Executive Committee, W. O. Thompson, of Ohio, chairman, H. J. Waters, of Kansas, Brown Ayres, of Tennessee, W. H. Jordan, of New York, and H. L. Russell, of Wisconsin.

The time and place of the next meeting were left as usual with the executive committee.

Afternoon sessions were held by the sections on college work and administration, experiment station work and extension work. In the college section, the initial paper was on "The Relation of the Agricultural College to Instruction in Agriculture and Home Economics in Secondary and Rural Schools," and "What the College Can Do to Promote General Rural School Improvement." In this paper, President E. T. Fairchild, of New

Hampshire, suggested that the agricultural colleges aid in securing the consolidation of scattered rural schools and their more liberal financial support, undertake a propaganda for rural high schools within the states and teachers' training classes in these schools, and favor a law requiring the teaching of agriculture in elementary schools and the training of teachers in the elements of agriculture. President Vincent, of Minnesota, also advocated summer sessions at the colleges for training rural teachers.

President D. H. Hill, of North Carolina, in a paper entitled "Some Changed Attitudes" called attention to the increasing tendency to magnify the educational value of utilitarian subjects. Inasmuch as the mere training of experts will not make leaders of men, he advocated the retention of some subjects which turn men's minds away from the purely materialistic point of view.

The cost of instruction in agricultural colleges and the relation of salaries in the division of agriculture to those of other divisions in the agricultural colleges and universities was discussed by President C. A. Lory, of Colorado. This paper described and illustrated by means of charts a system of cost keeping based on the units of semester credit, student semester credit and student recitation hour, the last named being found the most satisfactory.

President H. J. Waters, of Kansas, was elected chairman of this section for the ensuing year and President W. M. Riggs, of South Carolina, secretary.

In the experiment station section, under the topic of "Meat Production as a Factor in the Progress of Agriculture in the United States," George M. Rommel, of the U. S. Department of Agriculture, presented for Dr. A. D. Melvin and himself a paper on "Meat Production in the Argentine and Its Effect on the Industry in the United States." Although nearly 140,000,000 pounds of beef were imported from Argentina during the last year, they believed that killings are about as great as breeding conditions will warrant, and therefore need cause no serious concern to American pro-

ducers. On the other hand, it was thought that Argentina offers a possible market for breeding stock deserving of increased attention. Dean F. B. Mumford discussed "Meat Production on the High-priced Corn Lands," concluding that the methods which are likely to result in decreasing the cost of meat production and thereby making it possible for the farmers of the corn belt region to produce meat animals on high priced land are to be found in developing unimproved areas of land for grazing purposes; by utilizing the by-products of the farm, particularly coarse roughage such as stover, straw and cheap hay; by the general adoption of the silo as a means of preserving corn and other crops; by feeding more sheep and hogs because of their well-known efficiency in the utilization of feed-stuffs; and lastly, by the selection of more efficient meat animals. "The Possibilities and Methods of Meat Production in the South" were summarized by D. T. Gray, of North Carolina, who pointed out the advantages of this region in cheap lands and labor, mild climate and long growing season, and comparative nearness to markets, and believed that success was to be expected upon adapting the industry closely to southern conditions as to feeds, buildings, etc.

Dr. E. W. Allen, of the Office of Experiment Stations, explained the administration of experiment station work by projects. The project properly defined and limited has been found a convenient unit in planning, financing and supervising station work. It provides a record of the stations' activities, assists in defining the scope of this work and tends toward general economy and efficiency. The discussion following brought out a general concurrence as to the merits of the project system. A paper entitled "How Can American Agricultural Experiment Stations Gain Higher Standing as Institutions for Scientific Research," was read by Director S. B. Doten, of Nevada. The selection of high-grade men and the careful conserving of their time, and the provision of a scientific atmosphere were among the means suggested.

The section officers elected for the ensuing

year are Dean E. A. Burnett, of Nebraska, chairman; Director W. R. Dodson, of Louisiana, secretary; and W. H. Beal, of the Office of Experiment Stations, recording secretary.

The section on extension work held a joint session with the American Association of Farmers' Institute Workers, at which Dr. A. C. True took up the question of the use of the Smith-Lever fund for farmers' institutes as a phase of extension work. In this he drew attention to the strictly educational character of the extension work contemplated by the act and the great stress laid on practical demonstrations. The farmers' institutes, therefore, come within the provisions of the law only so far as they may be agencies through which the colleges can carry on work of this type. Where the institute system is directly connected with the colleges it is believed that they may be easily modified and restricted in scope so as to give them a distinctive place in the extension system. In states where the institutes are under the direction of other agencies, their maintenance apparently does not come within the provisions of the law, though there may be cooperation and participation by the college staffs. The eventual establishment of a county agent system will also affect the situation. Conditions as to farmers' institute administration at present vary so widely in different states that apparently the first need is a standardization of the institute.

The relation of farmers' institutes to organized extension agencies was also discussed by G. I. Christie, of Indiana. He believed that the institute is fulfilling a practical need but should be correlated with other extension work and brought under the supervision of the colleges.

As an example of a model farmers' institute address, Director C. E. Thorne, of Ohio, gave a paper on "Maintaining Crop Production." Former Dean L. H. Bailey, of Cornell University, closed the joint session with an address on "The Present Responsibility of the Rural People." This had special reference to the conditions brought about by the European war and emphasized the political responsibility of rural people in the progress of the nation.

The extension section also took up the problem of placing county agents in effective touch with farmers. C. B. Smith, of the States Relations Committee, indicated as among the essentials the employment of a well-trained representative, the making of a complete survey of the agricultural conditions, and the securing of the cooperation of the existing organizations, working through groups wherever possible. C. R. Titlow, of West Virginia, also advocated the utilizing of existing organizations, both official and non-official, and presented a chart showing graphically the correlation of the various agencies.

C. D. Jarvis, of Connecticut, discussed the planning of extension work by means of definite written projects, favoring in addition to the federal requirements a seasonal schedule for workers. K. L. Hatch, of Wisconsin, submitted a report from the committee on the training of extension teachers, advocating the provision of technical training along the special line of prospective extension work and instruction in the art of teaching. He suggested that the time necessary for this training might be secured by eliminating requirements of foreign languages and mathematics. Teachers of approved ability in secondary agricultural schools were suggested as a promising source of supply for extension work. The officers elected for the ensuing year were R. D. Hetzel, of Oregon, chairman; C. R. Titlow, secretary, and John Hamilton, of Pennsylvania, recording secretary. HOWARD L. KNIGHT

THE CONVOCATION WEEK MEETING OF SCIENTIFIC SOCIETIES

THE American Association for the Advancement of Science and the national scientific societies named below will meet at Philadelphia, during convocation week, beginning on December 28, 1914:

American Association for the Advancement of Science.—President, Dr. Charles W. Eliot, Harvard University; retiring president, Professor Edmund B. Wilson, Columbia University; permanent secretary, Dr. L. O. Howard, Smithsonian Institution, Washington, D. C.; general secretary,