SCIENCE

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FRIDAY, DECEMBER 2, 1898.

CONTENTS:

THE ASSOCIATION OF AMERICAN AGRICULTURAL COLLEGES AND EXPERIMENT STATIONS.

THE Association of American Agricultural Colleges and Experiment Stations, which held its twelfth annual convention at Washington, D. C., November 15th–17th, includes in its membership many of the State universities and scientific institutions in which instruction in many technical lines besides agriculture is carried on. It is a delegate body, each college being represented by its president or other officer, and each agricultural experiment station by its director or some other member of its expert staff. The institutions represented in this Association employ over 1,500 persons in their faculties, who are giving instruction to about 30,000 students. These institutions have over $50,000,000 in permanent endowments, buildings and equipment, and an annual revenue of nearly $6,000,000, of which more than $2,000,000 is derived from funds granted by the United States. Besides the work of instruction, they are carrying on original research in different directions. This is especially true in many scientific lines relating to agriculture, over a million dollars being spent for this purpose annually. There are now pending in Congress propositions to establish, in connection with these institutions, experiment stations for investigations in mechanic arts and naval engineering, for which some of

the colleges already have considerable facilities. The convention just closed was attended by delegates from every part of the country, and was regarded as a very successful meeting.

The annual address of the President of the Association, Dr. H. C. White, President of the Georgia State College of Agriculture and Mechanic Arts, was an unusually eloquent and able presentation of the breadth and strength of the education given along scientific and industrial lines in many of our land-grant colleges. He showed how 'the scholar' was the product of such education just as truly as of institutions built on classical foundations. He also pointed out that these institutions, which derive their support so largely from the United States Treasury, together constitute a great national university. The address thus furnished an appropriate introduction to the discussion of one of the most important topics taken up by the convention. There is a strong feeling among these institutions that the facilities for graduate study which are embraced in the great libraries, museums and scientific laboratories of the Government at Washington should be open to their students. A year ago the Association appointed a committee "to devise a plan whereby graduate students of the land-grant and other colleges may have access to, and the use of, the Congressional Library and the collections in the Smithsonian Institution, the National Museum and the scientific bureaus of the various Departments, at Washington, of the United States Government, for the purpose of study and research." This committee consisted of President Northrop, of the University of Minnesota; Secretary Cope, of Ohio State University; President Buckham, of the University of Vermont; President Ellis, of the State Agricultural College of Colorado; Chancellor McLean, of the University of Nebraska; President J. H. Washburn, of the Rhode Island College of Agriculture and Mechanic Arts. The committee, after a careful personal examination of the conditions in the different Departments at Washington, presented a report at this meeting of the Association, which included a recommendation that Congress be asked to pass the necessary legislation to organize a bureau of graduate study, preferably in the Smithsonian Institution, through which students from American colleges may have open to them the vast accumulations of scientific and other material for study existing at the National Capital. It was urged that this could be done at comparatively little expense, and that the high standing of the Smithsonian Institution in the scientific world, and its conservative organization, would enable it to carry on this work in a most creditable and satisfactory manner. The report was heartily endorsed by the Association, and the committee was instructed to make every effort to secure the necessary legislation at an early day. In this connection it may be interesting to note that it is the expressed intention of the Secretary of Agriculture to include in his forthcoming annual report a recommendation that the scientific divisions of the Department be open to a limited number of graduate students who will be admitted as the result of a competitive test, probably under the Civil Service Commission, and who may in some cases receive limited compensation for such services as they may render the Department in connection with their researches.

Another topic which attracted great interest at the meeting was the problem of more thoroughly organizing the military instruction which, under the law, is given in the institutions included in the Association. An able paper on this subject was read by President C. W. Dabney, Jr., of the University of Tennessee. In this paper, which received the hearty endorsement of the Association,

Dr. Dabney urged that the Government take steps to recognize these institutions more fully as agencies for the training of the officers who will be needed for our increased military establishment. A considerable number of the graduates of these institutions served with distinction in the war just closed, and there is good reason to believe that in the reorganization of our volunteer army it will be necessary to look to these institutions very largely for the trained material needed to put the volunteer army on a more efficient basis.

A notable paper was read by President A. W. Harris, of the University of Maine, on the relations of the churches to State colleges and universities. The author thought the different denominations should make some special provision at these colleges for students of their membership by building dormitories and chapels, and by organizing special courses of instruction in the immediate vicinity of the State college. In the discussion which followed, it was generally held that the churches might safely be left to promote their own interests through the agencies for church activity which are common in American communities.

The committee on methods of teaching agriculture presented its third report of progress, in which it gave a syllabus for a course of instruction in agronomy (plant production). The committee on indexing agricultural literature presented a library classification of agriculture (in its narrower technical sense) devised by Mr. W. P. Cutter, Librarian of the Department of Agriculture. The committee appointed by this Association to cooperate with the committee from the Association of Official Agricultural Chemists on uniformity in fertilizer laws brought in a schedule of twenty points, which both committees agreed were suitable for incorporation in the laws of the several States. By a very decisive vote the Association rejected propositions for the amendment of the constitution of the Association which looked to the abolition of the sections or their reduction in number. Meetings of all the sections were held during this convention and a number of interesting papers were read. Among the subjects most earnestly discussed were the inspection of nursery stock for the repression of insect and fungus enemies, and horticultural nomenclature.

The following officers of the Association were elected for the ensuing year: President, H. P. Armsby, Director of the Pennsylvania State College Agricultural Experiment Station; First Vice-President, J. E. Stubbs, President of the Nevada State University; Second Vice-President, C. S. Murkland, President of the New Hampshire College of Agriculture and the Mechanic Arts; Third Vice-President, J. L. Snyder, President of the Michigan Agricultural College; Fourth Vice-President, P. H. Mell, Director of the Agricultural Experiment Station of the Agricultural and Mechanical College of Alabama; Fifth Vice-President, F. P. Anderson, Professor of Mechanical Engineering of the Agricultural and Mechanical College of Kentucky; Secretary and Treasurer, E. B. Voorhees, Director of the New Jersey Agricultural Experiment Stations; Bibliographer, A. C. True, Director of the Office of Experiment Stations of the U. S. Department of Agriculture; Executive Committee: H. H. Goodell, President of Massachusetts Agricultural College; Alexis Cope, Secretary of Ohio State University; J. H. Washburn, President of the Rhode Island College of Agriculture and Mechanic Arts; W. M. Liggett, Director of the Agricultural Experiment Station of the University of Minnesota.

The following is a list of the papers read before the sections:

Section on College Work: 'Some Recent Changes in the Theory of Education,' E. A. Bryan, President

of the Washington Agricultural College and School of Science. 'Relations of the Churches to State Colleges and Universities,' A. W. Harris, President of the University of Maine.

Section on Mechanic Arts: 'What Preparatory Work should be Required to enter Four-Year Engineering Degree Courses,' O. L. Waller, Professor of Mathematics and Civil Engineering of the Washington Agricultural College and School of Science. 'Engineering Standard in Land-Grant Colleges,' W. H. Williams, Professor of Mechanical Engineering and Mathematics of the Montana College of Agriculture and Mechanic Arts.

Section on Horticulture and Botany: 'Laboratory Methods in Teaching Horticulture,' L. C. Corbett, Professor of Horticulture of the West Virginia University. 'Relation of Rainfall to Fungus Diseases,' B. D. Halsted, Professor of Botany and Horticulture of Rutgers Scientific School. 'Testing of Fruits by the Experiment Stations,' S. M. Emery, Director of the Montana Agricultural Experiment Station. 'Technical Training in Teaching Horticulture,' S. B. Green, Professor of Horticulture of the University of Minnesota. 'Preliminary Report of the Committee for the Testing of Races of Peaches,' R. H. Price, Professor of Horticulture, Botany and Entomology of the State Agricultural and Mechanical College of Texas

Section on Entomology: 'Entomology in Agricultural Colleges,' E. E. Faville, Professor of Horticulture and Entomology of Kansas State Agricultural College; S. A. Forbes, Professor of Zoology of the University of Illinois; H. Osborn, Professor of Zoology and Entomology of Iowa State College of Agriculture and Mechanic Arts; L. Bruner, Professor of Entomology of the University of Nebraska. 'A Fungus Disease of the San José Scale,' V. H. Lowe, Entomologist of the New York Agricultural Experiment Station. 'The Teaching Function of the Station Worker,' J. B. Smith, Professor of Entomology of Rutgers Scientific School. 'The Influence of Nature-Studies in Schools upon the Biology of the College Curriculum,' C. M. Weed, Professor of Zoology and Entomology of New Hampshire College of Agriculture and Mechanic Arts.

Section on Agriculture and Chemistry: 'Clover, Phosphates, and Wheat in Ohio,' W. I. Chamberlin, of Ohio. 'Productivity as affected by Tillage, I. P. Roberts, Director of Cornell University Agricultural Experiment Station. 'The Maintenance Ration of Cattle,' H. P. Armsby, Director of the Pennsylvania State College Agricultural Experiment Station. 'The Mission of the Agricultural and Mechanical Colleges and Stations from the Standpoint of the Agriculturist,' J. S. Newman, Professor of Agriculture of Clemson Agricultural College. 'Upon the Possibilities of drawing Erroneous Conclusions from Plant Soil Tests designed as Guides to the Economical Manurial Treatment of Soils, and to serve as a Basis for the Development of Reliable Chemical Methods for ascertaining their Requirements,' H. J. Wheeler, Chemist of the Rhode Island Agricultural Experiment Station. 'The Significance of Stock-Feeding Experiments,' C. F. Curtiss, Director of the Iowa Agricultural Experiment Station. 'Notes on Butter Tests of Cows, M. A. Scovell, Director of the Kentucky Agricultural Experiment Station.

A. C. True.

Washington, D. C.
November 22, 1898.

THERMAL EFFICIENCY OF STEAM-ENGINES.

A committee of the British Institution of Civil Engineers, composed of recognized authorities, has recently made a report, now published by the Institution, on the above subject, in which is proposed a standard and consistent scientific scheme for the treatment of thermal and thermodynamic quantities in the discussion of the experimentally determined efficiencies of the steam-engine. It is so important a document that we give space to a somewhat liberal abstract and summary of the conclusions of the committee.*

An introduction by the Secretary, Captain H. R. Sankey, gives a technical definition of the 'steam-plant' and points out the differences, the wastes, which distinguish the ideal and the real heat-engines. These differences are illustrated by an exceedingly interesting and helpful diagram in which the energy-flow is traced from its source in the fire-box of the boiler through the boiler and its contents of steam and water, on the one hand, for use in the engine, and, on the other hand, to the chimney as a waste. It exhibits the methods, extent and character of the wastes of thermal, of dynamic and of thermodynamic

* Report of the Committee appointed to consider and report to the Council upon the subject of the Definition of a Standard of Thermal Efficiency.—London, Published by the Institution, 1898.