vided with a long focus lens and an azimuth mark. The house containing the altazimuth is too small. The present building should be replaced by one of such size that collimators may be placed inside of the dome, and, as in the case of the prime vertical, a long focus lens and an azimuth mark should be provided.

For use with the meridian and prime vertical instruments three new chronographs are needed.

Special attention is called to the importance of a careful study of each instrument of the Observatory and a prompt publication of the results of such investigations.

LIBRARY.

The Library contains 18,025 bound volumes and 3,891 pamphlets. It is devoted to astronomy and mathematics, and the allied sciences, and is particularly rich in complete sets of the publications of observations, academies, and learned societies of Europe, many of which are rare as well as modern treatises and reports of investigations. It is admirably arranged and is in excellent order. The assistant librarian in charge has made considerable progress in the preparation of a comprehensive card catalogue, which will render the material on the shelves much more available.

The appropriation of $750, which is now provided for the Library, is not sufficient for its needs. About $350 of this is required to keep up the scientific journals and the works, such as yearbooks, which appear periodically. The remainder of the appropriation is not sufficient to provide the new books, engravings, photographs, and fixtures required, and to fill up gaps in the Library when special opportunity offers. It is recommended that the appropriation be increased to $1,000.

ADDITIONAL REQUIREMENTS.

In the opinion of the Board, there is urgently needed—

1. A repair shop for the instrument maker.

2. Residences for those who are regularly engaged in late night observations.

EXPENDITURES.

The expenditures for the Naval Observatory are presented in Exhibit D.

From the manner in which the appropriations have been made, it is not easy for the Board of Visitors to determine what portion of the expenditures pertains properly to astronomical work, what portion to naval work, and what portion to the improvement and care of the grounds as a park.

Respectfully submitted.

CHAS. A. YOUNG,
CHAS. F. CHANDLER,
ASAPH HALL, JR.,
E. C. PICKERING,
ORMOND STONE,
WILLIAM R. HARPER.

THE ASSOCIATION OF AMERICAN AGRICULTURAL COLLEGES AND EXPERIMENT STATIONS.

THE fifteenth annual convention of the Association of American Agricultural Colleges and Experiment Stations was held at Washington, D. C., November 12 to 14. President A. W. Harris, of the University of Maine, presided at the general sessions and delivered the president's annual address. This address set forth clearly the more important things for which the land-grant colleges stand and summarized the results of their work. The land-grant act of 1862 was considered important not only as providing for agricultural education, but as the first sufficient recognition of study and investigation as the basis of the best success in the arts and industries. It also proclaimed the duty of the national government to promote industrial education, and in its results demonstrated the effectiveness

of governmental cooperation. The most important of the direct results of this act to agriculture was the experiment station. "If the agricultural college did nothing more than to establish, maintain, and officer the experiment station, it would be justified many times over." The establishment of the agricultural colleges also caused the strengthening and broadening of industrial education along all lines and has culminated in a great system of technical education. "It is also a great result of the land-grant college to have asserted and established the doctrine that education in all its forms, from the lowest to the highest, is a State function in which the State has the fullest rights and for which it must bear the responsibility, sharing the privilege and responsibility with private corporations only as it thinks best." The speaker considered state aid and control in higher education as necessary to the best national development, and especially so because in this way the results of higher education become the property of all the people. The address concluded with an eloquent tribute to the memory and worth of Justin S. Morrill.

The report of the Executive Committee presented by its chairman, President H. H. Goodell, of the Massachusetts Agricultural College, called the attention of the Association to the fact that the bill for the establishment of schools or departments of mining and metallurgy in connection with the land-grant colleges passed the Senate, but failed to be called up in the House of Representatives during the last session of Congress. The introduction of a similar bill into Congress early in its next session was recommended.

The report of the Committee on Revision of the Constitution called forth a vigorous discussion. The Association refused to change its name. Among the important amendments adopted were those providing that the election of officers shall be by ballot upon nominations made on the floor of the convention, and that the program of the annual conventions of the Association shall hereafter be made up and distributed sixty days before the meeting of the convention; and "the subjects provided for consideration by a section at any convention of the Association shall concentrate the deliberations of the section upon not more than two main lines of discussion, which lines shall so far as possible be related. Not more than one-third of the working time of any annual convention of the Association shall be assigned to miscellaneous business."

The Committee on Graduate Study at Washington reported that no progress had been made since the last convention in securing a Government bureau in Washington for the administration of graduate work. The Association directed the committee to continue its efforts in this direction and, in the meantime, to secure if practicable the same opportunities for study and research in other departments of the government as are at present afforded graduate students in the Department of Agriculture. A resolution was also adopted by the Association recording its appreciation of the action of the government in making available the facilities for research and advanced work in the Department of Agriculture, and expressing a desire that these facilities may be still further extended and that a national university devoted exclusively to advanced study and graduate and research work be established.

The sixth report of progress was submitted by the Committee on Methods of Teaching Agriculture. Attention was called to the publication by the Department of Agriculture of the syllabi of courses in agrotechny, rural engineering and rural economics prepared by the committee last year. In surveying the progress of agricultural education in this country during re-

cent years the committee "found abundant evidence that the attitude of this Association and the work of this committee as its representative have already borne good fruit in stimulating and aiding the movement for the specialization of agricultural instruction in our colleges, the strengthening of agricultural faculties, and the bettering of the material equipment for agricultural education." The committee announced its intention to prepare and publish during the coming year a report on the courses in agronomy in our agricultural colleges and the facilities for instruction in this subject.

The Committee on Cooperative Work between the Stations and the Department of Agriculture made the following recommendations as supplementary to those embodied in the report submitted at the last convention: "(1) When cooperation is desired by the station it is deemed advisable that the proposal for such cooperation be made to the department by the director of the experiment station; where on the other hand the department desires the cooperation of the station, it is deemed advisable that the proposal be made in the first instance to the director rather than to members of the staff. (2) While it is well understood that no financial obligations can be undertaken beyond the end of the fiscal year, yet it should be recognized that any arrangement for joint experimentation which requires some years to complete creates a moral obligation upon both parties to carry the work to a conclusion. (3) Where a line of investigation has been in progress in any State under the auspices of either institution it is, as a rule, unwise for the other party to undertake independently the same line of investigation at least until after full consultation upon the subject."

The committee was continued with the addition of Professor B. T. Galloway of the Department of Agriculture.

The report of the Committee on Indexing Agricultural Literature called attention to the fact that progress in this direction could not be made by the Department of Agriculture until its library was provided with funds for this purpose. A paper on 'Agricultural College Libraries,' prepared and presented by Miss Josephine A. Clark, librarian of the Department of Agriculture, and a member of this committee, completed the report. This paper emphasized the great importance of libraries as aids to the work of investigation and instruction and pointed out the necessity of systematic arrangement and complete cataloguing of agricultural libraries. Arrangements in progress by the library of the Department for assisting agricultural colleges in classifying and cataloguing their libraries were explained.

The report of the bibliographer, A. C. True, noted the work of a bibliographical character being done by the Department of Agriculture, and enumerated with explanatory notes forty-four general and partial bibliographies in lines relating to agriculture issued during the past year.

The general plan of the graduate summer school of agriculture, as proposed by the Ohio State University at the last convention and approved by the Executive Committee, was explained by President W. O. Thompson of the University. It was stated that sufficient encouragement had been received from the leaders of agricultural education and research to warrant a decision to hold the first session of the school at the Ohio State University at Columbus, Ohio, during the summer of 1902. It was announced that Secretary Wilson had cordially approved the plan for this school, and that, acting under his advice, Doctor A. C. True, director of the Office of Experiment Stations, had consented to act as dean of the school. The Ohio State University makes itself responsible for the general management of the first session of

the school, but if it proves a success it is proposed to make it a cooperative enterprise, to be managed by a committee of control appointed by the Association. Future sessions may be held at institutions in different parts of the country. This plan for the school was endorsed by the Association and a prospectus of the first session will soon be issued.

The Association voted in favor of exhibits illustrating the progress of instruction and research in agriculture and the mechanic arts, at the St. Louis Exposition in 1903, and committees on these exhibits were appointed.

The resolution introduced by Professor W. A. Henry, of Wisconsin, was adopted by the Association, urging upon Congress "the necessity and wisdom of providing a building for the accommodation of the Department of Agriculture which in magnitude shall be sufficient to provide for its future, as well as present, needs, and which will properly represent in its architecture the enormous importance of agriculture in this country, and which will constitute a worthy addition to the government buildings of the capital of the United States."

In the section on college work a paper on the relation of agricultural colleges to the proposed national university, by President W. O. Thompson, of the Ohio State University, was presented in which the writer affirmed that in his judgment "the relation of the agricultural colleges to a national university should be that of sympathetic cooperation and enthusiastic support, as against all other measures whether proposed as substitutes or stepping-stones." This paper called forth a lively discussion in which it appeared that there was a general sentiment in the section in favor of securing some agency under government control for making the laboratories, museums, libraries, and other educational facilities in Washington available to advanced students.

W. M. Liggett, Dean of the College of Agriculture of the University of Minnesota, read a paper on the value of short courses, in which he described the different courses in agriculture given in Minnesota, and stated that he considered the short courses valuable adjuncts to the longer courses.

Honorable J. H. Brigham, Assistant Secretary of Agriculture, spoke of the short courses as a means not only of giving valuable instruction to farmers, but also of bringing about more cordial relations between the agricultural colleges and farmers. In his judgment "the best way to secure the support of farmers is to let them come to the college even for a short time and see that you are trying to do good."

In the section on agriculture and chemistry considerable time was given to a consideration of the question to what extent the Department of Agriculture and the experiment stations may profitably cooperate in the study of grass and forage plant problems and the lines of work which are likely to yield the most important results. Professor B. T. Galloway, chief of the Bureau of Plant Industry, gave a brief history of the cooperative forage plant work of the Department and the stations. He expressed his opinion that the success of the movement depended on grouping the stations with reference to the problems to be solved in different sections of the country, and devising a working plan for each group. The following lines of work were suggested: (1) The introduction of crops from foreign countries, (2) growing and disseminating introduced crops after they have become in a measure established, (3) dissemination of native crops of local value, (4) breeding crops for certain conditions, (5) increasing production by improved cultural methods. Professor R. H. Forbes, director of the Arizona Experimental Station, described the grass and forage crop conditions of that Territory, and gave an account of the co-

operative investigations carried on there. These investigations have for their object the improvement of the ranges through the exclusion of live stock, the sowing and harrowing in of seeds of native plants, the introduction of new forage plants suited to the arid region, and the construction of small embankments for holding the storm water. As conducted for two years on a reserve of 350 acres they have given promising results. Professor F. Lamson-Scribner, agrostologist of the Department of Agriculture, gave an account of the cooperative work under his direction, which includes arrangements with seventeen experiment stations.

The problems of irrigation in humid regions and the investigations in progress in this line were described and discussed by Professor Elwood Mead, of the Office of Experiment Stations; Professor E. B. Voorhees, director of the New Jersey Experiment Stations; F. H. Newell, of the U. S. Geological Survey and Professor H. J. Waters, director of the Missouri Experiment Station.

Papers on plant breeding were presented by Professor W. J. Stillman, of the Washington Agricultural Experiment Station, and Professor W. M. Hays, of the Minnesota Experiment Station. There was also a paper on the artificial plant food requirements of different soils and the methods employed in fertilizer experiments, by Doctor B. W. Kilgore, director of the North Carolina Experiment Station.

In the report of the section on horticulture and botany the marked strengthening of advanced courses in these subjects in colleges was pointed out. The demand for especially qualified men in horticulture was stated to be greater than the supply. There has recently been rapid progress in bacterial and physiological investigations and special studies on the selection and breeding of plants. At the meeting of the section there was an earnest discussion of the relations of instruction and research in horticulture in the agricultural colleges, called forth by a paper by Professor E. S. Goff, of the University of Wisconsin. The question of cooperation between the farmer and the experiment station, and the best methods of such cooperation, were also much discussed on the basis of the paper by J. Craig, of the New York Cornell Experiment Station. Other papers were also read in this section on observations concerning the first and second generations of plants, by Professor B. D. Halsted, of the New Jersey Agricultural Experiment Stations; on the effect of light and heat on the germination of Kentucky blue grass, and on the quality of some commercial samples of grass and clover seed, by E. Brown of the Bureau of Plant Industry.

Professor L. C. Corbett, of this Bureau, described the experimental farm of the Department of Agriculture which is being established on a part of the Arlington estate near Washington. It is intended to plant on this farm extensive collections of varieties of fruits in order to have authentically named specimens for comparative studies; cultural experiments with fruits and crops, and phenological investigations are also to be undertaken there. Mr. F. D. Gardner, of the Office of Experiment Stations, who is in charge of the newly established experiment station at Porto Rico, made an interesting exhibition of fruits which he had brought from that island; and H. J. Webber, of the Bureau of Plant Industry, exhibited specimens of cowpeas which are believed to be resistant to the attacks of nematodes.

In this connection it may be well to state that a newly organized society of official horticultural inspectors for the United States and Canada held its sessions in Washington, November 11 to 13. Representatives from fifteen States were present.

Professor S. A. Forbes, of the University of Illinois, presided. With regard to the limits of time within which nurseries may be inspected, it was found impossible to determine upon any definite period for all States, since the local conditions, requirements of State law, and other demands of State inspectors rendered uniformity in this matter impossible. In a discussion of the nursery pests which are to be regarded as dangerous enough to influence the granting of a certificate those mentioned by different inspectors as of chief importance included the crown gall, peach yellows, pear blight, San Jose scale, woolly aphis and sinuate pear borer. In a discussion of the question of the best insecticide for orchards infested with San Jose scale, the fact was brought out that the results of experiments with kerosene, crude petroleum and mechanical combinations of both these substances with water were not uniform in different States. Resolutions were passed to the effect that the time of inspection should be left to the discretion of the inspector of each State; that the certificate should not extend beyond the time of the beginning of the breeding period of the San Jose scale for the next year; that one form of certificate should be issued as a rule, which should be so worded that the stock could be sold after objectionable stock had been treated, as suggested by the inspector; and that in States which required inspection of nursery stock the expenses of inspection should be borne by the State.

The report of the section on entomology presented by Professor M. V. Slingerland, of the Cornell University Experiment Station, reviewed the progress of entomology during the past year, especially as regards instruction, investigation and inspection. At the meeting of the section the following papers were read: 'A Year's Experience with Crude Petroleum in New Jersey,' by Professor J. B. Smith, of the New Jersey Experiment Stations; 'Some of the most Important Insects in Massachusetts,' by Professor H. T. Fernald, of the Massachusetts Hatch Experiment Station; 'The Time of Emergence and Oviposition of the Spring Brood of the Hessian Fly,' by H. Garman, of the Kentucky Experiment Station; 'Life History of the Sugar Cane Borer in Louisiana,' by Professor H. A. Morgan, of the Louisiana Experiment Stations; 'Florida Observations and Experimental Work,' by H. A. Gossard, of the Experiment Station of Florida; 'Apple Aphids,' by E. D. Sanderson; 'A Folding Fumigator,' by F. A. Sirrine, of the New York State Experiment Station.

The report of the section on mechanic arts was presented by Professor H. W. Tyler, of the Boston School of Technology. This gave at some length the progress of instruction in mechanic arts during the year.

A reception tendered to the Association by the Secretary of Agriculture and Miss Wilson was numerously attended by the delegates and their ladies, and was thoroughly enjoyed by all who participated in it.

The following officers of the Association for the ensuing year were elected:

President, W. M. Liggett, of the College of Agriculture of the University of Minnesota; Vice-Presidents, W. O. Thompson, of the Ohio State University; H. J. Waters, of the University of Missouri; J. H. Washburn, of the Rhode Island College of Agriculture and Mechanic Arts; J. H. Worst, of the North Dakota Agricultural College; and J. C. Hardy, of the Mississippi Agricultural and Mechanical College; Secretary-Treasurer, E. B. Voorhees, of the New Jersey Experiment Stations; Bibliographer, A. C. True, of the Department of Agriculture; Executive Committee, G. W. Atherton, of the Pennsylvania State College; H. H. Goodell, of the Massachusetts Agricultural College; Alexis Cope, of the Univer-

sity of Ohio, and H. C. White, of the Georgia State College of Agriculture and Mechanic Arts.

Officers of sections: College Work, J. L. Snyder, of the Michigan Agricultural College, chairman; W. E. Stone, of Purdue University, Indiana, secretary; Agriculture and Chemistry, H. J. Waters, of the University of Missouri, chairman; C. G. Hopkins, of the University of Illinois, secretary; Horticulture and Botany, J. Craig, of the New York Cornell University, chairman; A. Nelson, of the University of Wyoming, secretary; Entomology, F. M. Webster, of the Ohio Experiment Station, chairman; H. E. Summers, of Iowa State College, secretary; Mechanic Arts, H. W. Tyler, of Massachusetts Institute of Technology, chairman; F. A. Anderson, of the Kentucky Agricultural and Mechanical College, Secretary.

A. C. TRUE.

MARCEL NENCKI.

BY the death, on October 14, of Professor Marcel Nencki, director of the Laboratory of Physiological Chemistry in the Institute of Experimental Medicine at St. Petersburg, physiological chemistry has lost one of its most active workers. Professor Nencki was born in Poland, January 15, 1847. After completing his medical studies at Berlin, he went to Berne in 1872, as assistant in the Pathological Institute of the Swiss University. At the same time he became Privatdocent in physiological chemistry; and his appointment to a chair in that subject, in 1877, was among the earliest recognitions which the science received as an independent field of study. In 1891 Professor Nencki went to St. Petersburg to take charge of one of the laboratories in the newly founded Institute, being succeeded at Berne by the late Professor Drechsel.

Of Professor Nencki's extensive contributions to organic chemistry, physiological chemistry and bacteriology, it will suffice here to recall his investigations on the chemistry of putrefaction and on the chemical processes which take place in the intestine; his studies on the behavior of aromatic bodies in the animal organism; his thorough researches on the pigments of the blood and on animal pigments in general; the investigation of the formation of ammonia and urea in mammals; and his last published paper (with N. Sieber) on the chemical composition of enzymes. In 1897, on the twenty-fifth anniversary of the beginning of his scientific activity, there appeared a volume entitled 'Sommaire des travaux accomplis par M. le professeur M. Nencki et ses élèves dans ses laboratoires à Berne et à St. Petersbourg.' 1869–1896. In recent years he has collaborated with Professor Andreasch in editing Maly's 'Jahresbericht über die Fortschritte der Thierchemie.' Although interrupted thus early, the work of a lifetime earnestly devoted to the pursuit of scientific truth has left many records of permanent value.

L. B. M.

SCIENTIFIC LITERATURE.

Studien über den Körperbau der Anneliden, V. By EDUARD MEYER. Translated from the original Russian. In Mittheilungen aus der Zoologischen Station zu Neapel, XIV., 3, 4, 1901. Pp. 338, 6 double plates.

Of the many attempts that have been made to explain the historical origin of the mesoblast and cœlome in higher animals, none is of greater interest than that of Professor Eduard Meyer, of the University of Kasan, whose views find their latest and fullest development in the present masterly paper, the product of many years of painstaking research by an uncommonly clear-sighted observer. All students of embryology are familiar with Hatschek's pregnant suggestion, made in 1877, that the mesoblastic pole-cells, characteristic of annelidan and molluscan development, were originally germ-cells, and that the cœlome of the annelids shows essentially the same relations as the gonad-cavities of the platodes. Accepting this sugges-