plants and others with root-tubercles is of this character.

2. The close symbiosis between "Azotobacter" and similar nitrogen-absorbing bacteria and many species of algæ is well known.

3. The increased production of timothy and other grasses when sown *along with clover,* not merely following, has been demonstrated.

4. The vigorous growth of plants in soils very rich in organic matter. Such material inhibits the growth of the nitrous-nitric bacteria when grown in culture, and may do so in soil, so that nitrates may not account for this vigorous growth.

5. As a general rule the most fertile soils contain the most bacteria.

6. The doctrine that nitrates furnish the nitrogen to plants was established before the activities of bacteria in the soil were suspected and should be re-investigated under conditions absolutely controlled as to sterility. It is probably true in large part, but may not be the exclusive method.

It would seem that one of the chief functions of bacteria in the soil is to prepare soluble organic compounds of nitrogen for the use of green plants. It does not appear to be really necessary that organic nitrogen compounds decomposing in the soil must be "ammonified," "nitrited" and "nitrated," as is now generally held since Winogradsky demonstrated the activities of bacteria in these lines to account for the presence of nitrates in the soil.

Experiments have been made by various observers in growing seedling plants of different kinds in water culture with one, or in some cases, several of the amino acids as sources of nitrogen. Most of these experiments have been disappointing. Plant proteins are not so different from animal proteins, nor plant protoplasm (apart from the chlorophyll-containing portions) from animal protoplasm as to lead one to suppose that it could be built up from one or two amino acids any more than animal protoplasm can. The writer is strongly convinced from investigations on this subject for several years that it should be thoroughly investigated. It will require careful experimentation and possibly rather large funds to provide the amounts of amino acids that would probably be needed, but might result in a decided change in current ideas of soil fertility and in the use of nitrogen fertilizers.

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The Philadelphia Meeting of the American Association for the Advancement of Science

The sixty-sixth meeting of the American Association for the Advancement of Science and of the affiliated national scientific societies was held in Philadelphia, December 28, 1914, to January 2, 1915. Houston Hall at the University of Pennsylvania was the headquarters and most of the meetings of the sections and affiliated societies were held in the various buildings of the university.

The registered number of members in attendance was one of the largest in the history of the association, being 1,086. The number for the affiliated societies could not be definitely ascertained. A number of institutions sent delegates to the meeting and ten foreign associates were elected for the meeting. The following affiliated societies met during the week:

American Physical Society.
The Geological Society of America.
Paleontological Society of America.
American Alpine Club.
American Society of Zoologists.
American Society of Naturalists.
American Association of Entomologists.
Entomological Society of America.
Botanical Society of America.
American Phytopathological Society.
Society for Horticultural Science.
Sullivant Moss Society.
American Microscopical Society.
American Fern Society.
American Anthropological Association.
American Folk-Lore Society.
American Psychological Association.
Southern Society for Philosophy and Psychology.
Society of American Bacteriologists.
American Federation of Teachers of the Mathematical and the Natural Sciences.

American Nature Study Society.
School Garden Association of America.
Society of Sigma Xi.

The formal opening of the association took place on Monday evening at the first general session when the meeting was called to order by the retiring president, Dr. Edmund B. Wilson. Dr. Wilson introduced the president of the meeting, Dr. Charles W. Eliot. After the welcoming address and the reply by the president, the retiring president delivered the annual address, on "Some Aspects of Progress of Modern Zoology." This meeting was followed by a reception to the members of the association and affiliated societies by Provost and Mrs. Smith in the university museum.

Two public lectures complimentary to the citizens of Philadelphia and vicinity were given during the week. The first was by Dr. Dayton C. Miller on "The Science of Musical Sounds," on Tuesday evening in the Asbury M. E. Church; the second lecture was by Dr. William H. Nichols on "The War and the Chemical Industry," on Wednesday at the same place. Both of these lectures were well attended.

The sections and affiliated societies held their meetings morning and afternoon during the week and many important papers were read.

Numerous smokers and dinners were held by the various societies. The University of Pennsylvania very generously furnished luncheon each day in the gymnasium for all of those in attendance.

The vice-presidential addresses given before the sections were as follows:

Section A: "The Object of Astronomical and Mathematical Research," by Frank Schlesinger.

Section B: "Recent Evidence for the Existence of the Nucleus Atom," by A. D. Cole.

Section C: "Theories of Fermentation," by C. L. Alsburg.

Section D: "Safety Engineering," by O. P. Hood.

Section E: "The Relief of our Pacific Coast," by J. S. Diller.

Section F: "The Research Work of the Tortugas Laboratory of the Carnegie Institution of Washington," by Alfred G. Mayer.

Section G: "The Economic Trend of Botany," by Henry C. Cowles.

Section H: "The Function and Test of Definition in Psychology," by Walter B. Pillsbury.

Section I: "The Social and Economic Value of Technological Museums," by Judson G. Wall.

Section K: "The Classification of Nervous Reactions," by Theodore Hough.

Section L: "The American Rural Schools," by P. P. Claxton.

Section M: "The Place of Research and of Publicity in the Forthcoming Country-Life Development," by L. H. Bailey.

The most important actions of the council were as follows:

The election of 256 members and 620 fellows.

The committee on policy recommended the following resolutions, which were adopted by the council.

Resolved, That the Committee on Policy shall consist of the president, the permanent secretary and nine other members, three to be elected annually. Non-attendance at the meetings for one year to constitute resignation from the committee.

Second. The following committee was elected; to serve for one year: Messrs. A. A. Noyes, R. S. Woodward and J. McKeen Cattell; to serve for two years, Messrs. D. T. McDougal, W. J. Humphreys and E. L. Nichols; to serve for three years, Messrs. H. L. Fairchild and E. C. Pickering.

Third. Dr. Stewart Paton was elected to fill the vacancy on the committee caused by the death of Dr. C. S. Minot.

Fourth. Dr. Edward S. Morse and Dr. T. C. Mendenhall were made life members of the association under the terms of the Jane M. Smith Fund.

Fifth. Herbert A. Gill was appointed as official auditor for the association.

Sixth. That all committees of the association which have not reported for two years be discontinued.

Seventh. The nomination by the sectional committee of Section I of Mr. Elmer E. Rittenhouse as a fellow and vice-president of that section was approved.

Eighth. The nomination by the sectional committee of Section D of Dr. Frederick W. Taylor as vice-president of that section was approved.

Ninth. There was voted an appropriation of

$1,800 for the salary and expenses of the associate secretary for the Pacific Coast Division for the coming year and $400 for use in an effort to increase the membership and any sum received from entrance fees in excess of $400 to be devoted to the same purpose.

Professor Pickering gave a résumé of the work of the committee on expert evidence and a report of progress on the work of the committee of one hundred on scientific research.

The following names were added to the Pacific Coast Committee:

Professor Henry Landes, University of Washington; President Enoch A. Bryan, State College of Washington; President M. A. Brannon, University of Idaho; Professor Maxwell Adams, University of Nevada; Professor Joseph F. Merrill, director of the School of Mines, University of Utah.

The following resolution from Section K was referred to the committee on policy:

Resolved, That this association establish a standing committee of five members to be known as the "Committee on the Protection of Scientific Research," that this committee from time to time prepare and publish in the name of the association such statements and resolutions as it may consider necessary in the education of the public concerning the value of animal experimentation in the advancing of the medical and biological sciences.

The two following resolutions were adopted.

Resolved, That there be authorized a finance committee of three of which the treasurer shall be a member and chairman.

Resolved, That a committee of seven be appointed on the administration of the income of the research funds of the association, the committee to be the five chairmen of the subcommittees already formed by the committee of one hundred on scientific research, namely, Messrs. E. C. Pickering, C. R. Cross, E. W. Brown, T. W. Richards and E. L. Nichols, and in addition Messrs. E. G. Conklin and R. A. Harper.

Messrs. H. C. Cowles, Henry B. Ward and Dr. Stewart Paton were elected members of the council for three years.

A minute in memory of Charles Sedgwick Minot presented by Mr. J. McKeen Cattell was adopted by a rising vote.

The council at its final meeting passed resolutions extending thanks to Provost Smith, of the University of Pennsylvania, and to all the organizations and institutions who did so much for the comfort and entertainment of the members of the association.

At the meeting of the general committee, the following officers were elected:

President: W. W. Campbell, University of California.

Vice-presidents:

Section A: A. O. Leuschner, University of California.

Section B: Frederick Slate, University of California.

Section C: W. McPherson, Ohio State University.

Section D: Bion J. Arnold, Chicago.

Section E: C. S. Prosser, Ohio State University.

Section F: V. L. Kellogg, Stanford University.

Section G: W. A. Setchell, University of California.

Section H: G. M. Stratton, University of California.

Section I: Geo. F. Kunz, New York.

Section K: F. P. Gay, University of California.

Section L: E. P. Cubberley, Stanford University.

Section M: Eugene Davenport, University of Illinois.

General Secretary: Henry Skinner, Philadelphia.

Secretary of Council: W. E. Henderson, Ohio State University.

C.-E. A. Winslow was elected secretary of Section K, to fill an unexpired term of two years.

Dr. L. O. Howard was again reelected permanent secretary for a term of five years.

The committee voted to hold the summer meeting at San Francisco, August 2 to 7, and the next winter meeting at Columbus, Ohio, from December 27, 1915, to January 1, 1916. A convocation week meeting in which all scientific societies are invited to join is recommended for New York City in 1916–17, and a meeting in 1917–18 to be held in Toronto or Pittsburgh.

E. L. Worsham,
General Secretary