SPECIAL ISSUE CONTAINING ACCOUNTS OF THE SESSIONS OF SECTIONS AND SOCIETIES AT THE FIFTH NEW YORK MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE AND ASSOCIATED SOCIETIES.
EDITED BY BURTON E. LIVINGSTON, PERMANENT SECRETARY

SCIENCE

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THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

ACCOUNTS OF THE SESSIONS OF SECTIONS AND SOCIETIES AT THE FIFTH NEW YORK MEETING

The Association Sections and the Associated and Invited Organizations

THE fifteen sections of the American Association were all represented in the great array of scientific sessions at the fifth New York meeting. In most instances one or more of the independent scientific organizations officially associated with each section met with the section at New York and, as is required by the laws of the American Association in such cases, the scientific programs for the respective fields of science of the sections were mainly those of the associated organizations in those fields. Several other independent scientific organizations, not officially associated with the American Association, also took part in the meeting, by invitation. The following list shows the names of all these organizations, arranged according to the association sections to which they are most closely related. Some of the organizations are related to more than one section and some are related to all sections—that is, to the American Association as a whole. For convenience of reference, the name of the president (or chairman) and that of the secretary of each organization are shown in this list, the officers named being those for the meeting here reported. Organizations whose names are followed by a cross or by one or two asterisks are officially associated with the American Association. Names marked by one or two asterisks are those of associated organizations that are also officially affiliated with the association. These have representation in the association council and in its section committees, those shown with a single asterisk having one council representative, while those shown with two asterisks have two representatives.

SECTION A (MATHEMATICS). *Chairman,* Raymond C. Archibald; *secretary,* Charles N. Moore, University of Cincinnati.

Related to Section A. (1) American Mathematical Society:** *President,* Virgil Snyder; *secretary,* R. G. D. Richardson, Brown University. (2) Mathematical Association of America:** *President,* Walter B. Ford; *secretary,* W. D. Cairns, Oberlin College.

SECTION B (PHYSICS). *Chairman,* P. W. Bridgman; *secretary,* A. L. Hughes, Washington University.

Related to Section B. (1) American Physical Society:** *President,* Karl T. Compton; *secretary,* Harold W. Webb, Columbia University. (2) American Meteorological Society:* *President,* W. J. Humphreys; *secretary,* Charles F. Brooks, Clark University.

SECTION C (CHEMISTRY). *Chairman,* C. E. Kenneth Mees; *secretary,* Gerhard Dietrichson, Massachusetts Institute of Technology.

SECTION D (ASTRONOMY). *Chairman,* J. S. Plaskett; *secretary,* Philip Fox, Northwestern University.

Related to Section D. (1) American Astronomical Society:** *President,* E. W. Brown; *secretary,* Raymond S. Dugan, Princeton University.

SECTION E (GEOLOGY AND GEOGRAPHY). *Chairman,* Frank Leverett; *secretary,* G. R. Mansfield, U. S. Geological Survey.

Related to Section E. (1) Geological Society of America:** *President,* Bailey Willis; *secretary,* Charles P. Berkey, Columbia University. (2) Society of Economic Geologists: *President,* William H. Emmons; *secretary,* Edward Sampson, Princeton University. (3) Paleontological Society of America:** *President,* A. F. Foerste; *secretary,* R. S. Bassler, U. S. National Museum. (4) Mineralogical Society of America:* *President,* Esper S. Larsen; *secretary,* Frank R. Van Horn, Case School of Applied Science. (5) Association of American Geographers:** *President,* Douglas W. Johnson; *secretary,* Charles C. Colby, University of Chicago. (6) National Council of Geography Teachers:† *President,* L. O. Packard; *secretary,* George J. Miller, State Teachers College, Mankato, Minn.

SECTION F (ZOOLOGICAL SCIENCES). *Chairman,* Michael F. Guyer; *secretary,* Geo. T. Hargitt, Syracuse University.

Related to Section F. (1) American Society of Zoologists:** *President,* Caswell Grave; *acting secretary,* L. B. Arey, Northwestern University Medical School. (2) Entomological Society of America:** *President,* E. O. Essig; *secretary,* J. J. Davis, Purdue University. (3) American Association of Economic Entomologists:** *President,* W. B. Herms; *secretary,* C. W. Collins, Melrose Highlands, Mass. (4) American Society of Parasitologists:* *President,* C. A. Kofoid; *secretary,* W. W. Cort, Johns Hopkins School of Hygiene and Public Health.

SECTION G (BOTANICAL SCIENCES). *Chairman,* Charles E. Allen; *secretary,* Sam F. Trelease, Columbia University.

Related to Section G. (1) Botanical Society of America:** *President,* A. H. Reginald Buller; *secretary,* A. J. Eames, New York State College of Agriculture, Ithaca, N. Y. (2) American Phytopathological Society:** *President,* H. P. Barss; *secretary,* R. J. Haskell, U. S. Bureau of Plant Industry. (3) American Society of Plant Physiologists:* *President,* E. J. Kraus; *secretary,* H. R. Kraybill, Purdue University. (4) Sullivant Moss Society:† *President,* R. S. Williams; *secretary,* A. T. Beals, 2929 Broadway, New York City. (5) American Fern Society;† *President,* William R. Maxon; *secretary,* Charles S. Lewis, 345 Hamilton Ave., Trenton, N. J.

Related to Sections F and G. (1) American Society of Naturalists:** *President,* H. H. Donaldson; *secretary,* L. J. Cole, University of Wisconsin. (2) Ecological Society of America:** *President,* Homer L. Shantz; *secretary,* A. O. Weese, University of Oklahoma. (3) American Microscopical Society:** *President,* Paul S. Welch; *secretary,* H. J. Van Cleave, University of Illinois. (4) Genetics Sections of American Society of Zoologists and Botanical Society of America: *Chairman,* H. J. Muller; *secretary,* L. C. Dunn, Columbia University. (5) Phi Sigma Biological Research Society:† *President,* Paul B. Sears; *secretary,* C. I. Reed, University of Illinois College of Medicine.

SECTION H (ANTHROPOLOGY). *Chairman,* Fay-Cooper Cole; *secretary,* Charles H. Danforth, Stanford University.

Related to Section H. (1) American Anthropological Association:** *President,* M. H. Saville; *secretary,* A. Irving Hallowell, University of Pennsylvania. (2) American Folk-Lore Society:† *President,* Alfred M. Tozzer; *secretary,* Gladys A. Reichard, Barnard College. (3) Archeological Institute of America:† *President,* Ralph V. D. Magoffin; *general secretary,* Rollin H. Tanner, New York University.

SECTION I (PSYCHOLOGY). *Chairman,* Howard C. Warren; *secretary,* Frank N. Freeman, University of Chicago.

Related to Section I. American Psychological Association:** *President,* Edwin G. Boring; *secretary,* Samuel W. Fernberger, University of Pennsylvania.

SECTION K (SOCIAL AND ECONOMIC SCIENCES). *Acting chairman,* Edwin B. Wilson; *secretary,* Charles F. Roos, 209 College Ave., Ithaca, N. Y.

Related to Section K. Metric Association:† *President,* George F. Kunz; *secretary,* Howard Richards, 156 Fifth Ave., New York City.

SECTION L (HISTORICAL AND PHILOLOGICAL SCIENCES). *Chairman,* G. M. Bolling; *secretary,* Leonard Bloomfield, University of Chicago.

Related to Section L. (1) History of Science Society:** *President,* Lynn Thorndike; *secretary,* Frederick E. Brasch, Library of Congress. (2) Linguistic Society of America:* *President,* Franz Boas; *secretary,* Roland G. Kent, University of Pennsylvania. (3) American Philological Association: *President,* Clarence P. Bill; *secretary,* Joseph W. Hewitt, Wesleyan University, Middletown, Conn. (4) College Art Association of America: *President,* John Shapley; *secretary,* James B. Munn, New York University.

SECTION M (ENGINEERING). *Chairman,* Robert L. Sackett; *secretary,* N. H. Heck, U. S. Coast and Geodetic Survey.

SECTION N (MEDICAL SCIENCES). *Chairman,* A. J. Goldforb; *secretary,* R. G. Hoskins, Harvard Medical School.

SECTION O (AGRICULTURE). *Chairman,* Charles A. Mooers; *secretary,* P. E. Brown, Iowa State College.

Related to Section O. (1) American Society of Agronomy:** *President,* A. G. McCall; *secretary,* P. E. Brown, Iowa State College. (2) Society of American Foresters:* *President,* O. M. Butler; *secretary,* Ward Shepard, U. S. Forest Service. (3) American Society for Horticultural Science:* *President,* C. P. Close;

secretary, Harold B. Tukey, New York State Agricultural Experiment Station, Geneva, N. Y. (4) Potato Association of America:† *President,* F. M. Harrington; *secretary,* H. C. Moore, Michigan Agricultural Experiment Station. (5) Association of Official Seed Analysts of North America:† *President,* E. H. Toole; *secretary,* A. L. Stone, University of Wisconsin. (6) Geneticists Interested in Agriculture: *Chairman,* C. M. Woodworth; *secretary,* Elmer Roberts, University of Illinois. (7) Crop Protection Institute: *Chairman,* W. C. O'Kane; *secretary,* Paul Moore, National Research Council.

SECTION Q (EDUCATION). *Chairman,* Truman L. Kelley; *secretary,* A. S. Barr, University of Wisconsin.

Related to the American Association as a Whole. (1) American Nature-Study Society:* *President,* Bertha C. Cady; *secretary,* E. Laurence Palmer, New York State College of Agriculture, Ithaca, N. Y. (2) Society of the Sigma Xi:** *President,* F. R. Moulton; *secretary,* Edward Ellery, Union College. (3) American Association of University Professors:** *President,* Henry Crew; *secretary,* H. W. Tyler, Massachusetts Institute of Technology. (4) Gamma Alpha Graduate Scientific Fraternity:† *President,* G. W. Martin; *secretary,* Sidney M. Cadwell, U. S. Rubber Co., New York City. (5) Sigma Delta Epsilon Graduate Women's Scientific Fraternity: *Secretary,* Josephine Glasgow, 236 Manning Boulevard, Albany, N. Y.

Accounts of the Scientific Sessions

The present issue of SCIENCE is mainly devoted to accounts of the scientific sessions of the sections and societies at New York. The general report of the fifth New York meeting appeared in the issue for January 25. The accounts here presented are based on material supplied to the permanent secretary by the secretaries of the respective organizations, to whom the association is greatly indebted for this valuable cooperation. As in recent years, requests for readable and interesting reports on the scientific sessions were sent long before the meeting to the secretaries of sections and of the societies that were to meet with the association and the request was repeated just before the meeting opened. It was again repeated by telegrams sent about January 12 to all the secretaries who had not already responded. Reports were received from all section secretaries and from the majority of the society secretaries. In those instances where an organization is omitted in the following accounts the reason for the omission is that no report was at hand when the accounts were prepared. A few of the reports received were suitable for these accounts without rewriting, but most of them were not what is needed. There were several reports in which an attempt was made to copy the program, or at least to mention nearly every author and every title, and most of them required drastic shortening, which had to be done by the permanent secretary under great pressure of haste, on the basis of whatever scanty judgment he may have possessed. These annual accounts of our great meetings might be greatly improved if the reports from which they have to be prepared might be more generally well written, clearly typed with wide spacing, and otherwise suitable for use without much alteration.

These accounts are arranged according to the list of organizations presented just above. It is to be noted the days of the week referred to are those from Wednesday, December 26, 1928, to Tuesday, January 1, 1929.

SECTION A (MATHEMATICS) AND RELATED ORGANIZATIONS

(*Report from C. N. Moore*)

Section A held a joint session on Friday afternoon with the American Mathematical Society and the Mathematical Association of America. Professor Dunham Jackson gave his retiring vice-presidential address, on "The Relation of Statistics to Modern Mathematical Research," which was published in SCIENCE for January 18. Professor J. L. Coolidge delivered an address on "The Heroic Age of Geometry," at the joint request of the American Mathematical Society and the Mathematical Association. He dealt with a period in the history of geometry which dates back approximately a century and was characterized by a great surge of creative activity of the highest order. Beginning with Feuerbach's beautiful theorem regarding the nine-point circle of a triangle and other important geometric discoveries, the speaker discussed the discovery and development of non-Euclidean geometry. Steiner's fundamental work on synthetic projective geometry was discussed and that of his French predecessors, particularly Poncelet, from whom he drew inspiration. The further development of the subject at the hands of Von Staudt and Klein was described. The address concluded with an account of some of the more notable features of the fundamental memoir of Gauss on curved surfaces. The paper was published in full in the January number of the *Bulletin of the American Mathematical Society.*

The sixth Josiah Willard Gibbs lecture, under the joint auspices of the American Mathematical Society and the American Association, was by Professor G. H. Hardy, of the University of Oxford, on "An Introduction to the Theory of Numbers." Illness unfortunately prevented Professor Hardy attending the meeting and his address was delivered, at a general session on Friday afternoon, by Professor H. W. Brinkmann. It was devoted to a popular account of the elementary theory of numbers and certain parts of the analytic theory of numbers. The introduction of elementary

number theory early in mathematical instruction was urged. On Friday morning, before the Mathematical Society, Professor W. F. Osgood delivered an address on "Maxime Bôcher" and the third award of the Bôcher memorial prize was announced. This prize is awarded at five-year intervals for a noteworthy memoir published in the interim in the Transactions of the American Mathematical Society. The recipient this year was Professor J. W. Alexander, of Princeton University. This session was concluded by an address by Professor James Pierpont and the annual business meeting of the society. The following are the names of the officers elected:

Trustees (two years): J. L. Coolidge, W. B. Fite, E. R. Hedrick, R. G. D. Richardson, Oswald Veblen; *president* (two years), E. R. Hedrick; *vice-president* (two years), Solomon Lefschetz; *associate secretary* (two years), Arnold Dresden; *member of the editorial committee of the Bulletin* (three years), W. R. Longley; *member of the editorial committee of the Transactions* (three years), Dunham Jackson; *members of the editorial committee of the Colloquium Publications:* G. D. Birkhoff (one year), R. L. Moore (three years), J. W. Young (two years); *members of the council* (three years): H. F. Blichfeldt, Daniel Buchanan, B. H. Camp, J. R. Kline, E. P. Lane.

Professor Osgood gave a vivid and inspiring account of the work of Maxime Bôcher, as a creative mathematician, as a sympathetic and stimulating teacher and as a leader in the development of mathematics, both at Harvard University and in the country at large; this paper will appear in the *Bulletin of the American Mathematical Society*. Professor Pierpont's paper dealt with a simplified treatment of the motion of the Maxwell top in a space of constant curvature. In addition to these papers of a more general nature, about ninety contributions were presented at four section meetings of the Mathematical Society on Thursday morning and Thursday afternoon, and at a joint session with section K (Social and Economic Sciences) of the American Association on Saturday morning. The meetings closed Monday with a symposium on quantum mechanics, under joint auspices of the Mathematical Society and the Physical Society, with papers by J. C. Slater and J. H. Van Vleck on the physical aspects of the theory, and by Professor Hermann Weyl and Norbert Wiener on the mathematical aspects.

The Mathematical Association of America held sessions Saturday morning and afternoon, at each of which three papers were presented. At the close of the morning session the annual business meeting was held, at which the following officers were elected: *President* (two years), J. W. Young; *Vice-presidents* (one year), E. T. Bell and W. C. Graustein; *Trustees* (three years), Florian Cajori, J. L. Coolidge, W. B. Ford, Oswald Veblen. Professor E. R. Smith was appointed to fill a vacancy on the board of trustees for one year and Professor R. D. Carmichael was appointed to represent the association in the National Research Council for three years. In the morning session Professor R. D. Carmichael showed how the use of the theory of recurrent sequences of integers serves to unify a large number of important results in the elementary theory of numbers. Professor H. W. Tyler gave an interesting account of certain features of the recent International Congress of Mathematicians at Bologna, and Professor Edward Kasner developed the geometric properties of a transformation defined by two analytic functions of two complex variables. In the afternoon R. V. Carpenter gave an account of the mathematics used by actuaries, John Swenson discussed the type of calculus instruction suitable for a high-school course, and Professor Einar Hille gave an account of the development of mathematics in Sweden.

On Friday evening occurred a dinner for all mathematicians. Professor Dunham Jackson acted as toastmaster, and several speakers discussed important matters pertinent to the promotion of mathematical study and mathematical research.

SECTION B (PHYSICS) AND RELATED ORGANIZATIONS

(Reports from A. L. Hughes and Charles F. Brooks)

Section B and the related societies held meetings on Thursday, Friday and Saturday, with an attendance of over four hundred at each session—perhaps a record for Section B. Approximately seventy papers were communicated in the program of the American Physical Society. A joint meeting was held on Monday with the American Mathematical Society, devoted to a symposium on quantum mechanics. Sixteen physicists and mathematicians contributed to the symposium.

A joint session of Sections B and D, the Physical Society, the Meteorological Society and the Astronomical Society was held at the American Museum on Friday, with two invited addresses. The first was on "A Great Telescope and its Possibilities," by Dr. W. S. Adams, of the Mount Wilson Observatory. As Dr. Adams was unable to be present, his paper was read by Dr. Seth B. Nicholson, also of the Mount Wilson Observatory. The lecture dealt with the possibilities of the new 200-inch telescope, made possible by a grant from the International Education Board to the California Institute of Technology. The new telescope will have twice the diameter of the largest telescope now in existence. Whereas stars of the twenty-second magnitude can now just be photographed, it is

expected that the new telescope will enable stars of the twenty-fifth magnitude to be photographed, which will help astronomers to improve their picture of the structure and extent of our own island universe. The new instrument will permit spectrum analysis of light from many more stars than can now be studied in that way. Perhaps the most immediate advance to be expected will be in the study of nebulae. Another branch of astronomy that will be much aided is the study of the heat of the stars and the surfaces temperatures of the moon and planets. The lecturer discussed the many formidable problems which arise in the designing, mounting and location of this great telescope, for the solution of which mechanical engineers, physicists, meteorologists, chemists and astronomers will all contribute. It is proposed to make the mirror, which will be nearly seventeen feet in diameter, weighing almost thirty tons, of fused quartz, silvered on one surface. The manipulation of such a huge disc of quartz has never yet been attempted. It is proposed to secure great concentration of light in the focal plane by having the focal length only 3.3 times the diameter of the mirror. When for special purposes a longer focal length is desired, an effective focal length twice as long can be obtained by a Cassegrainian mounting and one four times as long can be obtained by a coudé mounting.

The second invited address was given by Dr. W. J. Humphreys, of the U. S. Weather Bureau, on "Samples of Outdoor Physics." Dr. Humphreys pointed out that, though meteorology was at one time regularly studied by physicists, nowadays they generally gave little attention to this field and had not contributed much to meteorology in the last half century. The speaker's first sample of outdoor physics was the apparently unexplainable 45-degree angle between the direction of ocean drift and the direction of the wind producing it. Eckmann's able interpretation was briefly outlined. Air movements and consequent temperature changes were discussed in relation to the formation of certain types of clouds, etc. Some remarkable results due to tornadoes were illustrated by lantern slides. A further sample of outdoor physics is the mirage, which may be either acoustical or optical, and explanations of representative mirage types were given. Finally some remarkable lightning-flash photographs secured with a moving camera showed how several discharges in rapid succession all followed the ionized path blazed by the first.

The address of the retiring vice-president for Section B, Professor A. H. Compton, was given at the general session on Friday evening as the Sigma Xi lecture. An attractive and unusual feature of this lecture, on "What is Light?" was that it was fully illustrated by experiments. The speaker reviewed the overwhelming evidence which, in the nineteenth century, had apparently put the wave theory of light on an unassailable basis and then made reference to Planck's investigation on the law of radiation for black bodies, in which appeared the first glimmer of the view that the wave theory might not be wholly satisfactory. We are now faced with two large groups of experimental observations requiring two mutually antagonistic theories to account for them and the generalization that will include the wave theory and the photon theory, as different phases of a more comprehensive theory, is yet to come. The lecture concluded with an account of very recent evidence that electrons, hitherto regarded as highly localized particles, may behave, in certain respects, just as though they had the characteristics of waves. Thus light and electrons are similar in that both behave like waves in certain aspects and like particles in other aspects. Professor Compton's lecture was preceded by a joint dinner of the Physical Society and the Society of the Sigma Xi, in the Bird Room of the American Museum of Natural History.

The American Meteorological Society presented a varied program of twenty papers on Thursday, Friday and Saturday, with about forty persons attending each session. The joint session of Sections B and D and related societies, which was devoted to the addresses of W. S. Adams and W. J. Humphreys, has been mentioned above. Four of the meteorological papers dealt with meteorological aspects of aviation: W. R. Gregg described the rapidly developing airways weather service; W. H. Hobbs spoke on the Greenland flying route to Europe, and Alexander McAdie dealt with some weather hazards aviators must face and exhibited some new instruments. Four papers embraced the rainfall of New England, Baltimore, Honduras and China. Unstable climatic boundaries, small balloons for instruction in meteorology, the success of the first three years of Alter's trial long-range forecast of half-yearly rainfall for England, Cahill's and Goode's world maps for meteorologists, the effect of cool northerly winds on the temperature of the Gulf Stream in the Straits of Florida, forecasting relative humidity for fire-weather warnings, photographs of clouds in Greenland, and some storms that affect New England, are some of the many other topics presented and discussed. The presidential address, by W. J. Humphreys, on "Meteorology's Frozen Assets," made a strong appeal for the preservation of Wilson A. Bentley's unique collection of thousands of microphotographs of snowflakes, for the publication of C. Fitzhugh Talman's monumental dictionary of meteorological terms, for making our vast store of observational material for both land and sea more available and for the preparation of a

comprehensive summary of mathematical meteorology. The society adopted a resolution expressing its appreciation of Dr. Humphreys' address and voicing the hope that "the frozen assets of meteorology may be speedily liquidated." C. F. Brooks and W. R. Gregg were reelected secretary and treasurer, respectively, for 1929, and Isaac M. Cline, Henry J. Cox, Alfred J. Henry, Robert E. Horton and Robert DeC. Ward were elected councilors for 1929–31. Sir Frederic Stupart, who retires this year from the directorship of the Canadian Meteorological Service, and Dr. William Morris Davis were elected life fellows. Outstanding features of the secretary's and treasurer's reports were the 10 per cent. increase in membership in 1928 and the gift to the society of $2,000 to start an endowment fund. The meeting closed with an appreciative resolution addressed to Columbia University and other institutions and to the local committee of the American Association for the hospitality and excellent facilities that made this meeting so successful.

SECTION C (CHEMISTRY)

(Report from Gerhard Dietrichson)

The program of Section C was made up mainly of joint sessions with other groups. At the first of these, held with Section N on Thursday afternoon, six papers were presented on recent development in the chemistry of naturally occurring remedial agents. Professor Roger Adams gave his retiring vice-presidential address on "Synthetic Organic Acids as Substitutes for Chaulmoogra Oil." He reviewed extensive work by himself and his associates in attempting to find an effective remedy for leprosy. K. K. Chen presented the results of a study of ephedrine homologs and isomers with reference to the relationship between their pharmacological action and their chemical constitution and stereoisomerism. Charles E. Bills gave an extensive review of ergosterol chemistry, describing the methods used in attempts to produce vitamin D from ergosterol, with special attention to the use of the quartz spectrograph and the photoelectric cell. Oliver Kamm's paper on "Hormones from the Pituitary Gland" (abstracted in SCIENCE for January 25), which was awarded the annual American Association prize, was presented in this symposium. E. J. Cohn discussed the work that is being done toward isolating the active liver principle effective in the treatment of pernicious anemia. H. Jensen and John J. Abel gave a review of the chemistry of insulin, with special reference to the isolation and possible synthesis of the hormone which it contains.

On Friday forenoon Section C met with Section K (Social and Economic Sciences), the subject for discussion being "Economics and Chemical Progress." The chairman of Section C, Dr. C. E. K. Mees, called attention to the continual changes that are being made in chemical industries and to the economic problems involved. He was followed by L. V. Redman, who spoke about the cost of research and the ultimate possible returns in comparison with other forms of investment. The subject of research costs and accounting was presented by F. P. Byerly. In concluding the symposium, Charles H. Herty discussed cartels and combines in the chemical industries, expressing the idea that combinations are economically sound if they do not lead to monopoly.

Section C met jointly with Section M (Engineering) for a discussion of "The Chemistry of Metals." F. F. Lucas described high-power microscopic equipment developed in the Bell Telephone Laboratories for studying the structure of alloys, showing lantern slides of remarkably beautiful photographs and emphasizing the value of these in interpreting crystallization phenomena. In a paper on "Elastic Failure and Fatigue Failure of Metals," H. F. Moore pointed out the characteristics of these two effects and discussed the observed structural changes and the possible atomic relations involved. John Johnston emphasized the limitations of purely chemical specifications in the metal industry, saying that these should generally be supplemented by suitable physical and mechanical tests. The influence of surface films on corrosion was discussed by F. N. Speller, who pointed out that the formation of a suitable film seems to be the principal factor in preventing corrosion. E. H. Dix gave an interesting account of the composition and properties of various aluminum alloys that have proved useful in aircraft construction.

At the Saturday forenoon session Professor A. Frumkin, of the Karpow Institute of Chemistry in Moscow (visiting professor of colloid chemistry at the University of Wisconsin), gave a paper on "Hydrolytic Adsorption of Charcoal," showing that adsorption of acids by activated charcoal was directly dependent upon the presence of oxygen, whereas the presence of hydrogen had a corresponding influence on adsorption of alkalis. H. V. Arny outlined an extensive research problem undertaken by the American Pharmaceutical Association on the influence of light on medicinal chemicals. There was a well-attended luncheon meeting with the American Institute, with a series of talks on "Recent Advances in Synthetic Organic Chemistry." Roger Adams outlined many important developments in the field of synthetic medicinal chemicals. Charles H. Herty spoke of recent achievements in utilizing by-products, as in the lumber industry, and Edwin E. Slosson called atten-

tion, in his usual entertaining way, to some possibilities with respect to synthetic foods.

SECTION D (ASTRONOMY) AND THE AMERICAN ASTRONOMICAL SOCIETY

(Report from Philip Fox and R. S. Dugan)

Section D held all its sessions jointly with the American Astronomical Society. There were four sessions for the presentation of papers. Thirty papers were presented, covering a wide variety of astronomical thought, from the older, formal astronomy, including papers on double stars, stellar parallax and proper motion, and the application of astronomy to geodesy, through the various fields of astrophysics, including spectroscopy, photometry and radiometry. Only a few will receive special mention here. The extension of the work on stellar proper motions to the fainter stars by van de Kamp and Vyssotsky is of great value, but it is to be regretted that their work does not also include the determination of the parallaxes of the faint stars under investigation. Professor R. H. Curtiss gave an interesting report of the progress of the Lamont Astronomical Expedition to South Africa. The double-star survey projected by Professor Hussey is now in full swing, with a cooperative program arranged with the Union Observatory at Johannesburg.

Under the title, "On the Present Sun-Spot Maximum and a Correlation with Radio Reception," H. T. Stetson and G. W. Pickard gave some very interesting results. The correlation between sun-spot numbers and radio reception is surprisingly striking. In the field of spectrophotometry N. W. Storer gave some interesting results on the continuous spectra of giant and dwarf stars, deriving therefrom consistent values for stellar temperatures. Detailed studies of the lines of stellar spectra are taking a more and more prominent part in astronomical programs. At this session there were several papers on this subject, among the most interesting of which was that by Charlotte E. Moore, "A Note on the Relation between the Degree of Anomalous Dispersion and Line Intensity." V. M. Slipher spoke on the continuation of his pioneer studies on the spectral emission of the light of the night sky, showing some exceedingly interesting slides, with variation in the absolute and relative intensities of the lines at different periods and even at different hours of the night. The thanks of the astronomers are due to Professor George C. Comstock for his address on "Atmospheric Refraction," admirable in scholarly content and choice phrasing, presented by him as retiring president of the Astronomical Society and read by Joel Stebbins. Comment must be made on the magnificent planetary photographs by E. C. Slipher, of the Lowell Observatory. Those of Jupiter show the amazing outburst of activity noted by many observatories in the last few months.

In Professor H. H. Turner's address on "The Scientific Retrospect," given at a general session of the American Association, he urged that we give more heed to the history of our subjects and to the sequence of development of scientific ideas. The general session Tuesday evening was also devoted to an address on a strictly astronomical subject, "The Galaxy of Galaxies," by Harlow Shapley, a brief account of which appeared in SCIENCE for January 25.

The hundred or more astronomers in attendance found interest in visiting the new observatory on the roof of the new physics laboratory of Columbia University, where a 12-inch refractor telescope is successfully mounted on the roof of a fourteen-story building. Also, they found much interest in the developing astronomical section of the American Museum of Natural History.

SECTION E (GEOLOGY AND GEOGRAPHY) AND RELATED ORGANIZATIONS

(Reports from G. R. Mansfield, Charles P. Berkey, R. S. Bassler, Frank R. Van Horn, Chas. C. Colby and Geo. J. Miller)

For the first time in eight years the Geological Society of America and its affiliated societies met with the American Association and about eight hundred persons were in attendance, which constitutes a record. The sessions of the geological group were all very conveniently housed in the School Service Building of the American Museum of Natural History. Professor Charles Schuchert, retiring vice-president for Section E, was unable to attend the meeting, but his address, on the "Geological History of the Antillean Region," was read by C. O. Dunbar, before a joint session of Section E with the Geological Society. Section E joined with the related societies in sessions at which the addresses of their retiring presidents were read and in the geological smoker Wednesday evening and the dinner Friday evening. Twenty-four papers were presented before the joint session on Wednesday, which were necessarily short but of very good quality. Discussion centered chiefly about the papers by R. F. Flint ("Glacier Stagnation and the Dissipation of the Last Ice Sheet"), L. E. Spock ("Pliocene Deposits of Central Mongolia"), Eugene Callaghan ("Geology of the Vertebrate Fossil Locality at Maragha, Persia"), Robert Balk ("Primary Structure of the Adirondack Anorthosite") and A. C. Swinnerton ("Changes of Base-Level Indicated by Caves in Kentucky and Bermuda"). Thursday was marked by a symposium on the "Centenary of the Glacial Theory," given at a general session of the association, and another general session was devoted to geology

that evening, with a fine address by Charles P. Berkey, on "Recent Discoveries in the Geology of Mongolia." Another fine feature was a group of geological exhibits displayed in the Hall of Education of the American Museum, those of the Geological Survey of China, the U. S. Geological Survey and the New York State Museum being specially noteworthy.

The meetings of the Geological Society, the Paleontological Society and the Mineralogical Society were all notable for large attendance and the high quality of the papers presented. The total registration was 722. Six hundred people attended the smoker given Wednesday evening by the local fellows of the Geological Society, and over four hundred persons attended the forty-first annual dinner. Over 175 scientific papers were presented before the Geological Society and the affiliated organizations.

At the joint session with Section E on Wednesday twenty-five papers were presented by the younger men, some of which called forth considerable discussion. Henry Fairfield Osborn, president of the American Museum of Natural History and president of the American Association, delivered a brief address of welcome Thursday morning, which was followed by the presentation of scientific papers. On Wednesday evening Bailey Willis delivered the presidential address for the Geological Society, on "Continental Genesis." A symposium on "Continental Problems" was held Friday morning. On Thursday afternoon an appreciative audience heard the address of the retiring president of the Mineralogical Society, Esper S. Larsen, Jr., entitled, "Temperature of Magmas," given at a joint session of the Mineralogical Society and the Geological Society. A striking feature of the annual dinner was the presentation of the Penrose medal of the Geological Society of America to Jakob Johannes Sederholm, director of the Geological Commission of Finland, the presentation address being made by Frank D. Adams. Dr. Sederholm is the second recipient of this medal, which was presented a year ago for the first time to the late Professor T. C. Chamberlin. At the dinner were given addresses under the general caption, "Our Growing World": "Twenty-five Years of Geophysics," by Arthur L. Day, "Nature, Research, Education," by John C. Merriam, "Astronomy and Geology," by F. R. Moulton and "Sources of Energy," by R. A. Millikan.

The officers of the Geological Society for 1929 are:

President, Heinrich Ries; *vice-presidents,* William S. Bayley, U. S. Grant, Ermine C. Case and Arthur L. Parsons; *secretary,* Charles P. Berkey; *treasurer,* Edward B. Mathews; *editor,* Joseph Stanley-Brown; *councilors,* H. Foster Bain, Henry B. Kummel, George R. Mansfield, William E. Wrather, Herdman F. Cleland and Elwood S. Moore.

The Paleontological Society of America held its twentieth annual meeting on Thursday, Friday and Saturday, with 103 members present and a program of seventy papers dealing with many branches of paleontology. There was a symposium on Arctic geology and paleontology, focusing attention on unsolved problems in this field. Another symposium dealt with the Paleozoic-Mesozoic boundary of the Rocky Mountain region and a joint session with the Geological Society was devoted to stratigraphic geology. The program included a number of papers on vertebrate paleontology, ranging from studies of Carboniferous amphibia to ground sloths of almost recent times preserved in an extinct volcano in New Mexico. Other papers were in general more technical and covered a wide range of subjects. The officers of the Paleontological Society for 1929 are:

President, E. C. Case; *vice-presidents,* B. F. Howell, Chester Stock and Jos. A. Cushman; *secretary,* R. S. Bassler; *treasurer,* Carl O. Dunbar; *editor,* Walter Granger.

The Mineralogical Society held a session Thursday afternoon, preceding the joint session with the Geological Society, at which the retiring president of the Mineralogical Society, Dr. E. S. Larsen, delivered an address on "The Temperature of Magmas." He considered the crystallization of a granodiorite or of a diorite or gabbro with quartz and orthoclase, the succession of the intrusion of a batholith, the equilibrium diagrams of the feldspar group and other systems, and the difference in the thermal contact metamorphism caused by granite and gabbro, showing positively that a magma of the composition of granite crystallizes at a lower temperature than does one of the composition of gabbro. He concluded that the temperatures of basalt and gabbro magmas at the time of eruption or intrusion is about 800° or 900° C., while that of rhyolite, pegmatite and granite is between 600° and 700° C. On Friday afternoon a joint session was held with the Society of Economic Geologists, at which Charles Palache read an outstanding paper on "Paragenetic Classification of the Minerals of Franklin, New Jersey, and a Comparison of them with the Minerals of Långban, Sweden." At Franklin about 130 minerals (containing notably iron, manganese and zinc) were formed during four periods, while at Långban about eighty different minerals (containing chiefly iron and manganese) were formed during three periods.

The meeting was attended by about seventy-seven persons and thirty-two papers were read. The officers elected for 1929 are:

President, A. L. Parsons; *vice-president,* Edward Wigglesworth; *secretary,* F. R. Van Horn; *treasurer,* A.

H. Phillips; *editor*, W. F. Hunt; *councilor* (1929–1932), C. S. Ross.

The New York meeting marked the twenty-fifth anniversary of the founding of the Association of American Geographers. It was held in the buildings of the American Geographical Society and Columbia University, and the arrangements were so excellent as to be a model for such meetings. The program carried the largest number of titles in the history of this organization and was specially characterized by the twenty-fifth anniversary dinner and by a field study of the port of New York. At the dinner Albert Perry Brigham, first secretary of the Association of Geographers, presented a tribute to William Morris Davis, its founder and three times its president. Professor Davis was unfortunately unable to attend this meeting but a letter and a telegram from him were read. The retiring secretary presented a review of the work of the association from its founding in 1904 to the present time. The dinner program concluded with a highly significant address on "The Prospects of Geography," by Douglas W. Johnson, retiring president, who analyzed the status of geography in western and central Europe.

An outstanding phase of the work of the American Geographical Society was outlined by Ray R. Platt, in a paper on "Progress on the Millionth Map of Hispanic America." Mr. Platt displayed the sheets already completed and remarked on some of the difficulties of securing source materials. Another important project of the society was discussed by John K. Wright, in a paper on "The New England Studies of the American Geographical Society." The program involved a study of the geographic relations of population.

A field survey of the port of New York was made on Thursday, arranged through the much appreciated courtesy of the mayor's committee on reception to distinguished guests, of which the Hon. Grover A. Whalen is chairman. The committee's official steamer was made available for this trip. An invited paper on the port was read by Lester E. Klimm. Commercial sections along North River were viewed and stops were made at the terminal of the New York Barge Canal (at Gowanus Bay), at the Bush Terminal (in Brooklyn) and at the newly created port of Newark. The committee for this field study consisted of W. L. G. Joerg, John E. Orchard and Lester E. Klimm, to whom the association is indebted for a remarkable demonstration of how a day's scouting may lead to significant observations and to stimulating discussion.

Five sessions were devoted to contributions and sixteen introduced papers had to be read by title only. These were of great variety and showed that significant and challenging work is being done by the younger men and women. The members' papers indicated great present interest in regional studies, especially detailed and systematic investigation of small unit areas. A study of this type, which displayed both a maturing technique and a gratifying allegiance to a well-defined discipline, was that of V. C. Finch, on "The Service Area of Montfort: A Study of Landscape Types in Southwestern Wisconsin." Other outstanding examples were papers by Robert S. Platt ("A Field Study of a Sugar District: Mariel, Cuba") and by Glenn T. Trewartha ("The Suwa Basin: A Geographic Study in the Japanese Alps"). R. H. Sargent presented "Notes on Certain Geographic Features of Alaska," representing the noteworthy work that has been carried forward for a quarter of a century by the Alaskan division of the U. S. Geological Survey. The present great interest in polar regions has led J. Paul Goode to invent "A New Projection for the World Map: The Polar Equal Area," by the use of which polar cartography will be greatly facilitated. Regional studies in the field of anthropogeography were illustrated by Ellen C. Semple, in a stimulating paper on "Irrigation and Land Reclamation in Ancient Mediterranean Lands." Wallace W. Atwood, in a paper entitled "Some Open Problems in the Physiography of North America," called attention to recent progress in geomorphology.

The next annual meeting of the Association of Geographers will be held in Columbus, Ohio. The officers for 1929 are:

President, Lawrence Martin; *vice-president*, R. M. Brown; *secretary*, D. H. Davis; *treasurer*, Robert S. Platt.

The New York meeting of the National Council of Geography Teachers was outstanding in the number of papers presenting the results of research on geographic education. Research studies needed immediately were outlined by De Forest Stull, including such questions as: What are fundamental principles, objectives for grades VI to IX, geography's place in the curriculum, the difficulties of learning, reading and map-reading. The presidential address, by Professor L. O. Packard, dealt with "Geography and World Citizenship," who held that our best hope lies in the hands of youth, which is not hampered by tradition. This theme was independently reflected in the report of the committee on geography in the high school, which presented a tentative outline of two courses for the senior high school: "Political Geography of the Major Nations," and the "Geography of Man's Work." The first emphasizes the adjustments that man has made and is making, being a course in world citizenship. The second course is

designed for senior high-school pupils electing work in home economics, shop work, the trades and commerce and it deals with world climate, resources, production, transportation and consumption. William C. Bagley gave a stimulating paper concerning the element of adventure in the teaching of geography and he made a plea for teacher-scholars as well as for research scholars. He remarked that explorers should receive mention in geography as well as in history. Another stimulating paper, given at the annual dinner, was by Frank McMurry, who is engaged in working out a study of a variety of communities in different parts of the world, to show the intimate relationship between the lives and work of the people and their natural environment. W. R. McConnell urged better preparation of teachers, holding that the child can often excel the teacher in seeing relationships and that general scholarship is one of the greatest needs of the geography teacher. J. Paul Goode showed that great progress has been made in the preparation of maps for school as well as maps for scientific use. He remarked that American atlases are far behind those of Europe. Nels A. Bengtson pointed out that the economic, commercial or industrial aspects of geography are now the principal types taught in American high schools. R. H. Whitbeck discussed geography in higher education, pointing out that about 80 per cent. of American colleges now offer courses in this science.

SECTION F (ZOOLOGICAL SCIENCES) AND RELATED ORGANIZATIONS

(Reports from Geo. T. Hargitt, L. B. Arey, J. J. Davis, C. W. Collins and W. W. Cort)

All the biology sessions were held in Teachers College, Columbia University, and the facilities were unusually satisfactory, for which sincere thanks are here expressed to the local committees for their efficient work and to Teachers College for its hospitality. The New York Zoological Society entertained visiting zoologists at luncheon at the New York Zoological Park on Thursday, and there was an inspection of the park. On Thursday evening the local zoologists were hosts at a reception and smoker held in Darwin Hall of the American Museum. The setting of the museum rooms greatly enhanced the pleasure of the evening and there was a showing of motion pictures of subtropical marine life taken under water by Dr. William Beebe. Professor Clarence E. McClung, of the University of Pennsylvania, retiring vice-president for the section, gave his retiring vice-presidential address, on "The Nature of Biological Papers and the Obligations of their Authors," at the zoological dinner Friday evening. He analyzed the scope of zoological journals, pointing out the obligations of authors in preparation of manuscripts, means by which authors could best reach their readers and the need for careful consideration by authors and editors of how best to accomplish the aims of authors and journal. This address is to be published in SCIENCE. On Sunday the Long Island Biological Association and the Carnegie Station for Experimental Evolution conducted an excursion to Cold Spring Harbor for the inspection of the laboratories there. There were two general sessions specially interesting to zoological workers: (1) the showing of the famous Canti film on cell division, etc., by Dr. C. A. Kofoid, and of the Carnegie Institution film on the rabbit's egg by Dr. Warren H. Lewis, on Friday afternoon, in the Horace Mann auditorium at Columbia University, and (2) the Saturday evening address of Dr. William M. Wheeler, given at the American Museum, which appears in the *Scientific Monthly* for February. Accounts of both these general sessions have appeared in SCIENCE for January 25. The considerable expense involved in securing the Canti film (about $35) was met from the current funds of the American Association, including the rental charged for the film by the University of California, and the large audience that saw it was very grateful to Dr. Kofoid for his clear explanation of the pictures. The Carnegie Institution film had been recently prepared by Dr. Lewis and Dr. P. W. Gregory, of the Department of Embryology of the Carnegie Institution, and it was contributed by that department. This is the first motion picture ever made of any developing mammalian egg and it represents the first time living mammalian eggs have been under observation in artificial media for more than forty-eight hours. Some of these eggs developed for eight days, about a quarter of the regular gestation period. We are much indebted to Dr. Lewis for his running comments as the film was shown.

Fifty-four papers were read on the program of the Society of Zoologists, exclusive of those on joint programs with the geneticists, parasitologists and ecologists. These were distributed as follows: general and comparative physiology, 31; protozoology, 4; comparative anatomy, 4; cytology, 5; embryology, 8; miscellaneous, 2. On Thursday afternoon the program was given over to demonstrations and exhibits, including the presentation of several papers by motion pictures. There were about thirty-six demonstrations, exclusive of those before joint sessions, and the interest exhibited in this form of presentation warrants its continuance and expansion. The maintenance of the exhibits throughout the entire meeting would make them still more valuable.

Besides the Canti film and the Carnegie Institution film, mentioned above, two other motion pictures were shown that were interesting to zoologists. "The

Story of Antivenin" was illustrated by means of a film by R. H. Hutchison and R. E. Stadelman, on Thursday afternoon, and the American Museum contributed a showing of motion pictures of wild life in the Gobi Desert and of African mammals, the latter by Mr. and Mrs. Martin Johnson.

The Entomological Society of America held its twenty-third annual meeting on Thursday and Friday with twenty-eight papers on a wide range of subjects. One afternoon was devoted to a symposium on "Present Trends in Systematic Entomology," at which the speakers were C. T. Brues, W. T. M. Forbes, J. A. Hyslop, J. C. Bequaert, J. A. G. Rehn and J. M. Aldrich. A paper on "The Detection and Estimation of Insect Chitin and the Relation of Chitinization to Hardness and Pigmentation of the Cuticula of the American Cockroach," presented by F. Leslie Campbell, aroused much favorable comment. The author gave reasons for abandoning the terms "chitinized" and "non-chitinized." Another interesting paper was presented by L. O. Howard on "*Aphelinus mali* and its Travels." The woolly apple aphis was early introduced into England, Germany and other countries and the resulting consequences were serious. It has failed to present an important problem in America, probably because of the presence here of an Aphelinus parasite. In 1920 Dr. Howard introduced the parasite into France and subsequently to many other parts of the world, and it has now become practically cosmopolitan and quite thoroughly controls the woolly aphis. The annual public address of the Entomological Society was given this year by Dr. Royal N. Chapman on "The Potentialities of Entomology." Officers for 1929 are: *President,* C. T. Brues; *secretary-treasurer,* J. J. Davis.

The American Association of Economic Entomologists met from Thursday to Monday, with about 250 members and visitors present. At the meeting of the Section of Plant Quarantine and Inspection (L. S. McLaine, *chairman;* S. B. Fracker, *secretary*), Mr. McLaine emphasized the increasing importance of quarantine regulations and the necessity that they be based on scientific investigations. Reports of national and regional plant boards were presented by their officers. Several phases of the plant quarantine operations of the U. S. Department of Agriculture were discussed by C. L. Marlatt, C. H. Hadley, L. H. Worthley, A. F. Burgess, Max Kisliuk, Jr., and E. R. Sasscer. Dr. H. H. York presented a paper on "The Woodgate Rust," and there was a symposium on "Important State Quarantines." Officers of the Quarantine Section for 1929 are: F. N. Wallace, *chairman,* and S. B. Fracker, *secretary.*

Before the Section of Extension (P. D. Sanders, *chairman;* G. F. MacLeod, *secretary*) Dr. T. J. Headlee presented a paper on "Administrative Phases of Teaching, Research, Regulatory and Extension Entomology," which was followed by interesting discussion. V. I. Safro discussed "Extension Entomology in Relation to Research" and J. A. Hyslop led discussion on the "Insect Pest Survey."

The Section of Apiculture (H. F. Wilson, *chairman;* E. N. Cory, *secretary*) was addressed by the chairman and eleven papers were read, dealing with many phases of apiculture. G. M. Bentley is chairman for 1929 and E. N. Cory continues as secretary.

The program of the main Association of Economic Entomologists opened Friday morning with the usual business session, followed by the address of President W. B. Herms on "Experimental Method as Applied to Entomological Investigations." This paper was freely discussed and evoked much favorable comment. There were two papers on "Insects as Biological Controls," followed by twenty-two papers on "Insects Affecting Fruits." These papers covered various phases of banding, spraying, baiting and attrahents for the codling moth. Similar papers dealt with the control of the Oriental peach moth, sprays for the grape berry moth, cutworms destructive to blueberries, effects of oil sprays on citrus fruits and the history of the Mexican fruit worm and bud moth. The Saturday morning session opened with the papers on "Insects Affecting Cereal, Forage and Field Crops," with discussions of leaf hopper injury, tropisms of the Mexican cotton boll weevil and parasites and corn ear-worm injury to sweet corn. Five papers were presented on the European corn borer, and discussion of this organism was led by Dr. C. L. Marlatt, who complimented the workers in research and spoke on the damage produced by this insect. There were five papers on "Miscellaneous Subjects" and two on "Insects Affecting Ornamental Plants." Saturday afternoon nine papers were offered on phases of work with the Japanese beetle, including treatment of nursery plants, parasites and the mechanical trap as a measure in control. Fourteen papers dealt with "Insecticides and Appliances," presenting studies on sprays, dusts, stickers and fumigation. The entomologists' dinner occurred Saturday evening, with an attendance of more than 250 members and guests. Dr. William M. Wheeler acted as toastmaster, calling for brief remarks from several leaders. Papers on "Insects Affecting Truck Crops" were presented Monday morning, dealing with laboratory studies on the digestive enzymes of the potato beetle, field studies on the onion maggot, cucumber beetles and carrot rust fly. There were two papers on "Insects Affecting Forest and Shade Trees." Dr. T. J. Headlee is president for 1929, E. R. Sasscer is first vice-president and C. W. Collins is secretary.

The American Society of Parasitologists held its fifth annual meeting from Thursday to Saturday, with about sixty members present. Perhaps the outstanding feature of the program was the address of the retiring president, Dr. C. A. Kofoid, on "The Protozoa of the Human Mouth," in which he outlined important advances with regard to bacteria and amebae as related to the etiology of pyorrhea. E. C. Faust discussed the relationships of the different species of the broad tapeworm (Diphyllobothrium) in China and suggested that human sparganosis might be due to the larval stages of any one of several species. N. R. Stoll reported extensive series of experiments on the common stomach nematode of sheep, *Haemonchus contortus,* in which self-cure and protection of the host occurred under conditions of reinfection in the field as well as with controlled doses of infective larvae indoors. M. M. Metcalf gave an interesting discussion of the use that has been made of data from parasites in studying problems of taxonomy, geographical distribution and paleography, and emphasized the possibilities of further advance by the study of host-parasite distribution. Robert Matheson and E. H. Hinman showed that situations where chara grows abundantly are not favorable for the breeding of mosquitoes. F. M. Root gave a comprehensive analysis of the relative importance of the different species of American anopheles in the transmission of malaria, and pointed out that, since only a limited number of forms were important carriers, "species control" in many areas is entirely feasible. R. W. Hegner reported experimental studies on the transmission of intestinal protozoa of man and other animals to the chick, showing that fowls may transmit certain human intestinal protozoa. E. E. Tyzzer demonstrated that several distinct species of coccidia of the genus Eimeria, which have been grouped as *Eimeria avium,* may be distinguished by physiological as well as by morphological differences.

An unusually interesting feature was a motion picture by A. E. Woodhead, on the life history and behavior of two species of trematodes, in connection with which he demonstrated his methods, using comparatively simple and inexpensive apparatus. Forty-nine papers were on the program, including the address of the retiring president and the eight invited papers. Of the forty contributed papers fifteen were read by title. Seven contributions were on protozoology, twenty-nine were on helminthology and four on medical entomology or general parasitology. As has been true for the past few years, the majority of the papers were on the experimental phases of the subject. While systematic and morphological studies are still an important part of American research in parasitology, they do not dominate the field as they did a decade ago. Emphasis seems now to be on experimental researches. Many papers were on subjects of practical importance, eleven being on some phase of human parasitology while ten dealt with the parasites of domesticated animals. A study of the abstracts of all these papers, which appeared in the *Journal of Parasitology,* shows a rapidly growing interest in parasitology. An exhibit on "Parasites in Relation to Human Disease" was arranged by the society as part of the American Association's general exhibition, and this created much favorable comment. The following officers were elected for 1929:

President, N. A. Cobb; *vice-president,* G. R. La Rue; *secretary-treasurer,* W. W. Cort; *new council members,* F. C. Bishopp, A. C. Chandler and C. W. Stiles.

SECTION G (BOTANICAL SCIENCES) AND RELATED ORGANIZATIONS

(Reports from Sam F. Trelease, Arthur J. Eames, F. E. Denny, C. W. Dodge, F. C. Meier, B. E. Gilbert, A. T. Beals and R. C. Benedict)

A joint session for all botanists was arranged by Section G, with invited papers of general interest. William Crocker gave the vice-presidential address on "Germination Studies in Relation to Ecology and to Practice." Albert F. Blakeslee spoke on "Cryptic Types in Datura Due to Chromosomal Interchange and their Geographical Distribution." J. H. Craigie spoke on "Heterothallism in the Rust Fungi." M. B. McKay read an address on "Recent Studies of Curly Top." These were all very valuable contributions, but inadequate space prevents giving more than the titles here.

The Botanical Society of America held a most successful meeting from Thursday to Monday with a registered attendance of 325, this being the largest meeting in the history of the society. The annual dinner for botanists was held on Friday evening, with 308 present. L. H. Bailey, president of the society for 1926, delivered the presidential address, which he was unable to deliver a year ago. This was followed by a smoker arranged by the Torrey Botanical Club. The following officers were elected: *President,* Margaret C. Ferguson; *vice-president,* Lester W. Sharp; *treasurer,* George E. Nichols; *representative in the National Research Council,* Ivey F. Lewis. The General Section of the society held three sessions, at which thirty papers were read, reporting research in comparative morphology, cytology, paleobotany, living histories, etc. The cytological papers dealt in part with the structure of chromosomes and with the relationship of chromosome number to classification and to sterility. The paleobotanical papers dealt with Devonian plants in America. A number of papers discussed pollen analysis as indicating the his-

tory of bogs and as related to classification. Other papers dealt with the life histories of algae, the shape of cells, the persistence of living cells in old tree trunks, the cytology of the cambium cell and embryogeny in monocots. The sessions ended with a discussion of the sequence and coordination of undergraduate courses in botany in institutions of various types.

The Mycological Section held two sessions with papers on cytological, morphological and physiological researches on fungi. Sophia Satina and A. F. Blakeslee reported distinct male or female tendencies in some of the homothallic Mucoraceae. Margaret B. Church discussed the growth of yeasts in solutions of high osmotic pressures (21–25 atmospheres). A. H. R. Buller reported further observations of the mechanism of spore discharge in the discomycetes and the possible function of the asymmetric position of the operculum. At a joint session of this section with the Phytopathological Society, A. J. Mix presented further results on the culture and cytology of the Taphrinaceae. M. T. Cook reported on the life history of *Plasmodiophora vascularum* from the tracheary tissue of the sugar-cane, where it does not cause hypertrophy.

The Physiological Section held four regular sessions with about 125 persons in attendance. Thirty-three papers were presented, five of which were related to the inorganic nutrition of plants. E. F. Hopkins showed that growth can be controlled by controlling the iron-ion concentration through varying the citrate concentration of the medium. Wanda K. Farr presented further results of the study of root hairs in calcium sulphate solutions and exhibited three-dimensional models showing the interrelation of concentration, pH and growth. T. W. Turner furnished evidence that the effect of phosphate in decreasing the ratio of tops to roots is not due to a direct influence on root growth. Walter T. Swingle, T. Ralph Robinson and Eugene May found that certain root-stock types exhibited resistance to boron injury and could be utilized with advantage in the propagation and growth of citrus and related plants. Four papers upon the general subject of plant propagation were given. L. Knudson reported that the fungus usually associated with *Calluna vulgaris* is not necessary for the germination of the seeds. William Crocker showed that apple seeds do not lose their vitality after a year's dry storage. P. W. Zimmerman and A. E. Hitchcock presented the results of a series of experiments on the place of origin of roots in woody cuttings, the importance of the presence of leaves in modifying the type of root growth, and the capacity of the cutting to absorb water through bark, leaf scars and even leaves. Four papers dealt with the problem of translocation of materials within the plant body. L. H. MacDaniels and O. F. Curtis reported on the path of transfer of substances in the stem after a spiral ring twice around the stem had been made. F. C. Steward emphasized the slowness of diffusion of sugars through living membranes and of the inadequacy of the diffusion process to account for the transfer of substances. O. F. Curtis showed that local chilling interferes with translocation of sugars and salts, thus indicating that living cells are concerned in normal solute movement, probably through the mechanism of protoplasmic streaming. R. H. Wallace reported that, although several substances were tested, only ether vapor would suspend the seismonic movements of *Mimosa pudica*, and R. Hartshorn described experiments on the use of acetylene in the ripening of bananas. Other papers covered a wide range of subjects. D. B. Anderson described methods of demonstrating the existence of layers of cutin, cellulose and pectic compounds in cell walls. N. J. Youden and I. D. Dobroscky determined the pH value for many types of physiological fluids by means of the glass electrode and compared these values with those obtained by other methods. David I. Macht described methods of obtaining polarized light and showed its effects in stimulating the growth of plants. Lois Lampe described the influence exerted upon the development of the cells of the corn endosperm by the conditions of light and temperature which prevail during the time the kernels are developing. O. W. Richards showed that a second cycle in the growth of a population of yeast begins in about 130 hours after the first seeding and reported on the influence of the acidity, number of injured cells and carbohydrates and alcohol content of the solution. An important feature of the program consisted of two motion pictures shown by F. E. Lloyd on the trap-door of Utricularia and on contractile vacuoles. The Physiological Section held two joint programs with the Society of Plant Physiologists. The first was a symposium on the "Effects of Radiation on Plants." H. W. Popp and Florence Brown showed that exposure of the germinating seeds of several species to various dosages of ultra-violet light did not produce stimulation of growth and this caused much discussion because of its disagreement with some previous reports. T. H. Goodspeed and A. R. Olson showed remarkable results obtained when the tissues of Nicotiana were exposed to X-rays, mitotic disturbances being associated with the development of variant forms and these variant characters from X-rayed cells being definitely inherited. The second of the joint programs was a symposium on "Recent Advances in Cell Physiology." The officers of the Physiological Section for 1929 are: *Chairman*, B. M.

Duggar; *vice-chairman,* S. C. Brooks: *secretary-treasurer,* F. E. Denny. The Systematic Section held a session Thursday morning, where papers were presented dealing with widely different subjects in this field, such as the genus concept, generic limitation, distributional problems, introduced trees and early collections.

The American Phytopathological Society held its twentieth annual meeting from Friday to Monday with an attendance of about 200, the largest for many years. The membership is now nearly 800. The following officers were elected for 1929: *President,* R. J. Haskell; *vice-president,* H. S. Fawcett; *secretary-treasurer,* F. C. Meier; *councilor,* H. P. Barss. The council named H. B. Humphrey as editor-in-chief of *Phytopathology.* There were eighty-three papers delivered before the society's various sections and fifteen in two joint sessions with Section G, of the American Association, and with the Mycological Section of the Botanical Society. The papers may be classified as follows: cereal diseases, 20; vegetable diseases, 14; fruit diseases, 14; miscellaneous diseases, 12; bacterial diseases, 13, and diseases of ornamentals, 10. The phytopathologists' dinner was held Saturday night at the Hotel Astor and was attended by 186 people, including many charter members and ten former presidents. R. J. Haskell presented a report on the progress of the society and of phytopathology in general. Dr. and Mrs. John Monteith, Jr., presented slides and motion pictures of charter members of the society, and a humorous program was much enjoyed. On Friday morning there was a symposium on plant quarantine. Papers pertinent to the subject were read by W. A. McCubbin, C. D. Marlatt and C. R. Orton. On the afternoon of the same day was held the joint session with Section G, of the American Association. A similar session with the Mycological Section of the Botanical Society was held on Saturday afternoon. Experiments reported by R. S. Kirby showed that the mechanical removal of smut balls from wheat is an effective method of control. W. H. Tisdale and W. N. Cannon showed ethyl mercury chloride to be effective in controlling smut diseases. Seasonal conditions at the time of maturation of wheat and corn affect the resistance to disease and the subsequent yield of the crop from that seed, according to J. G. Dickson, P. E. Hoppe, J. R. Holbert and G. Janssen. *Penicillium* injury to corn is due to oxalic acid formed by the fungus, as reported by H. Johann. That net-necrosis and leafroll of potatoes are manifestations of the same disease was reported by G. H. Gilbert. A. G. Newhall and J. D. Wilson were able to control the Cladosporium leaf mold of tomatoes in greenhouses by the installation of forced air ventilation. Meteoric water and not insects appears to be the important agency in the dissemination of the fire-blight organism, according to P. W. Miller. F. O. Holmes reported on local lesions on Nicotiana inoculated with the virus of tobacco mosaic and their use in determining virus concentrations, etc. A. J. Riker reported on critical temperatures for infection by various bacteria and stated that more pronounced infection could be obtained by exposing plants to moist-chamber conditions for a day prior to inoculation. The occurrence of bacterial pustule of soy beans without any pustular outgrowth was announced by S. G. Lehman, who also stated that seed treatment failed to control this disease. Studies by W. H. Wright, A. J. Riker, H. E. Sagen and W. M. Banfield have resulted in the differentiation of bacteria that cause hairy root and are distinct from the crown-gall organism and from bacteria of the Radiobacter group. Many new diseases were reported. The importance of giving more attention to research and extension work related to the production and distribution of disease-free seeds and plants was emphasized at the annual conference on extension work, held Friday afternoon. The crops taken up and the leaders of the discussion were: Beans, M. F. Barrus; tomatoes, C. E. Temple; cabbage, R. H. Porter, and sweet potatoes, G. W. Fant. Committees were appointed, the members of which have since prepared summaries of recommendations for use by research and extension workers on many crops. Valuable suggestions were made by many representatives of commercial groups. A noteworthy session was held Sunday evening, when representatives of transportation companies, the cold storage industry and the fruit and vegetable distributors spoke. At 3:30 A. M. on Monday, eighty "hardier souls" met D. H. Rose and F. C. Meier for an early trip to the wholesale market district of lower Manhattan. Brief visits were paid to the Pennsylvania Railroad terminal piers, to one of the Merchants Refrigerating Company's warehouses and to the Washington Street fruit and vegetable wholesale houses.

The fifth annual meeting of the American Society of Plant Physiologists was held from December 28 to 31. Amendments to the constitution and a plan to more permanently finance the Charles Reid Barnes life memberships were adopted. On Saturday evening there was a dinner for plant physiologists at which it was announced that the third award of the Charles Reid Barnes life membership had been made to Dr. H. A. Spoehr. Two joint sessions of the society and Section G were held at which many very valuable papers were given. A symposium on "Recent Advances in Cell Physiology" was well attended. F. C. Steward discussed critically the findings of Hansteen-Cranner and others, with regard to their chemical

evidences of the presence of phosphatids in amounts sufficiently great to function in the regulation of cell permeability. Repetitions of the methods used by this school but under sterile and controlled conditions have cast doubt on their theory of the function of lipoids in permeability. The function of plasm colloids in growth and permeability was discussed by H. L. van de Sande Bakhuyzen. The Hofmeister series was found to apply to swelling and other colloidal phenomena taking place in the cell. An interesting description of the types of apparatus in use by the micrurgist and the physiological problems to which they are adapted was given by W. Seifriz. Studies on the viscosity of protoplasm, surface membranes, physical properties of cell walls, functions of cell parts, micro-injection and electrical properties of cells can be made with the micro-manipulation technique. Stuart Dunn and A. L. Bakke described further studies on absorption of dyes as a means of determining relative hardiness in twig tissue of apple. F. G. Gustafson, working with tomato, found that the respiration of the fruit is correlated with physiological age. The germination of the pollen grains of a large number of plants was discussed by F. M. Andrews, who stated that the longevity of pollen was less than is generally supposed. Eloise Gerry gave an interesting account of the methods being employed in the selection of southern pines for high yields of oleoresin. A. C. Sessions and J. W. Shive, working with oats grown in constant drip culture solutions, found that an increase in the ammonium nitrogen of the solution resulted in a decrease of inorganic nitrogen and an increase of organic nitrogen in the plant. A. L. Stahl and J. W. Shive reported on the relative rates of absorption of nitrogen by plant roots from nitrates and ammonium salts in culture solutions. Some very interesting observations of a chlorosis produced by magnesium deficiency in field corn were shown by John P. Jones. Constance E. Hartt reported that potassium increased or decreased activity of certain enzymes in sugar cane and had no effect upon other enzymes. That treatment of the raw, sawgrass soils of the everglades with mixtures of copper and zinc salts is found beneficial for the growth of the peanut was shown by R. V. Allison. Raymond H. Wallace gave an interesting description of the response of certain light-sensitive plants to animal anesthetics.

The various sections of the country were well represented in the New York sessions of the Sullivant Moss Society. Several new mosses were reported and also new stations for several rare species. A discussion Friday morning on "What the Members of the Sullivant Moss Society can do to Advance the Study of Bryology" was led by T. C. Frye, in which it was emphasized that encouragement should be given to young workers and that concentration of attention on a limited number of species made for better progress than attempting to work over too large a field. As an aid in collecting and exchanging moss specimens, a committee of five members was appointed to prepare a modern check list of the mosses of North America. There were a number of noteworthy exhibits at this meeting: one of recent short publications on mosses; several of unusual species of mosses, hepatics and lichens, also photographs of good moss collecting localities in mountain regions of British Columbia, and drawings of hepatic species. The officers for 1929 are R. S. Williams, *president,* and A. T. Beals, *secretary-treasurer.*

The American Fern Society met on Saturday and Sunday afternoons. A program of four papers was presented on Saturday before a group of about fifty. John G. Schaffner, speaking on "Diagnostic Characters of Equisetum," showed how the American species of Equisetum are separable into series, with parallel variations differentiating the species of each series. Edgar T. Wherry described experiments in the "Soil Preferences of American Ferns," and a simple apparatus by which soil acidity or alkalinity may be tested in the field. He showed also, with the help of slides, the differentiation of the Asplenium species of the eastern United States. C. A. Weatherby pointed out, with specimens, some of the "Recent Systematic Work on Northeastern Ferns." On Sunday afternoon a group of twenty members visited the fern houses of the Brooklyn Botanic Garden, to examine particularly several Nephrolepis forms: wild species, horticultural bud variations and sporeling sports that have originated at the garden.

ORGANIZATIONS RELATED TO SECTIONS F AND G

(Reports from E. C. MacDowell, A. O. Weese, L. C. Dunn and A. I. Ortenburger)

The American Society of Naturalists conducted a symposium on Saturday afternoon, at which the neuro-motor system of protozoa was discussed. Professor G. N. Calkins described the complex and unified systems of specialized protoplasmic fibrils of flagellates and ciliates, which connect the motor elements (cilia, flagella, membranelles) with the central motorium. Although these structures suggest a conductive function it remains for experiments such as those of C. V. Taylor to demonstrate conduction. If a protozoon such as *Euplotes* be bisected, the two parts behave in different ways, and the differences depend on the direction and position of the cut. If incomplete transection severs fibrillae motor incoordi-

nation results, whereas cuts avoiding the fibrils cause no incoordination. The system of fibrils and motorium is indeed conductive and protozoa are physiologically complex. Evolution has resulted in adaptations in these one-celled forms as well as in metazoa. Professor William Seifriz discussed the phenomena of protoplasmic contractility. He suggested that protoplasm may possibly be of a sort of crystalline nature, with some of the properties of both liquid and solid. The president of the society for 1929 is G. H. Parker and the secretary is L. J. Cole.

The Ecological Society of America met on Thursday, Friday and Saturday. The Thursday afternoon session was held jointly with the Botanical Society and the Saturday forenoon session was with the Society of Zoologists. The president's symposium, on "Methods in the Study of Vegetation," was held Friday afternoon, the discussion being led by H. L. Shantz and L. A. Kenoyer; G. E. Nichols, H. C. Cowles, J. W. Toumey and R. L. Piemeisel discussed various aspects of the general subject. It was reported that a tentative agreement had been reached for the initiation of a series of ecological monographs in 1931. Officers were elected as follows: W. C. Allee, *president;* Geo. P. Burns, *vice-president;* A. O. Weese, *secretary-treasurer.*

The eighth annual meeting of the Genetics Sections of the Society of Zoologists and the Botanical Society surpassed previous ones in attendance and in number of papers presented. At the three sessions for the reading of papers the average attendance was about 170. Sixty-eight contributions by seventy-eight authors were presented. Twenty-six of these were given in the usual way, an equal number were given by demonstration and sixteen were read by title. One session was devoted to fourteen papers on changes in genes and chromosomes effected by X-rays and radium. L. J. Stadler (working with X-rays on barley) and F. B. Hanson (working with radium emanation on Drosophila) agreed that the rate of mutation was proportional to the amount of energy employed. Hundreds of new mutations were observed, most of them lethal. A. F. Blakeslee, J. T. Buchholz, J. L. Cartledge, Dorothy Bergner, Sophia Satina and A. G. Avery reported on many effects of radium emanation on Datura. H. J. Muller and Edgar Altenburg announced that X-rays cause the transfer of whole pieces of chromosomes to take place about as frequently as new mutations. The induced translocations of blocks of genes were verified both cytologically and genetically. R. E. Cleland and Fr. Oehlkers presented evidence to support the view that the genes of Oenothera, although scattered among the chromosomes like those of other plants and animals, are unusual in that they associate themselves in groups or circles of various sizes, the circle rather than the individual chromosome behaving as a single linkage group. Demonstrations of plant chromosomes were given by several investigators. Officers for 1929 are as follows: *Chairman,* A. F. Blakeslee; *secretary-treasurer,* P. W. Whiting; *society representative,* E. W. Lindstrom. The Interim Committee of the International Genetics Congress (*chairman,* C. B. Davenport) reported the acceptance of an invitation of Cornell University to hold the Fourth International Genetics Congress at Ithaca between August 10 and 20, 1932. The permanent committee for this congress consists of T. H. Morgan, L. J. Cole, C. B. Davenport, E. M. East, R. A. Emerson, H. S. Jennings and G. H. Shull.

The American Microscopical Society held its forty-seventh annual meeting at New York. The following officers were elected for 1929: *President,* Gilbert Morgan Smith; *vice-presidents,* D. H. Wenrich and Libbie H. Hyman; *treasurer* (three years), A. M. Chickering; *member of executive committee,* E. M. Gilbert.

The Phi Sigma Biological Society devoted Thursday to the reading of papers on research by student members, and to a visit to the American Museum of Natural History. A. I. Ortenburger was elected secretary, in place of C. I. Reed, who recently resigned. Dr. Ortenburger will remain editor of *The Biologist.* Paul B. Sears, *president,* and Erwine Hall Stewart, *treasurer,* were reelected. It was voted that Phi Sigma is not to be regarded as an honorary society in the usual sense; it is a "guild of working students in biology." At a dinner meeting on Wednesday an inspiring address was given by Dr. M. M. Metcalf, which was followed by interesting discussion.

SECTION H (ANTHROPOLOGY) AND RELATED ORGANIZATIONS

(Reports from C. H. Danforth, J. Alden Mason and Rollin H. Tanner)

Papers on the program arranged by Section H were mainly limited to those dealing with morphology and physical anthropology, other anthropological papers being presented before the Anthropological Association. A paper by Miss Eleanor Phelps offered an interesting contribution to craniological technique; a mathematical analysis of relative shifts in reference points for a series of Eskimo, Peruvian and Australian skulls pointed the way to improvements in methods for comparing diverse groups of crania on the basis of their morphological centers of gravity. Truman Michelson reported on measurements of a large series of Australian crania. A collection of skulls from New Mexico, reported upon by E. A.

Hooton, proved of special interest because all are accurately dated by archeological strata and represent successive samples of what appears to have been a continuous population inhabiting the same locality for several centuries. No less than eleven fairly distinct types of skull are found in this collection and all of the types were present throughout the whole period studied. Their relative numbers gradually changed, however, and the population became progressively more Mongoloid with an ever-increasing incidence of primitive features. The change appears to have been brought about not by environmental factors but by some form of differential selection or survival. Fay-Cooper Cole reported upon four skeletons from Algeria, which appear to be remains of individuals who lived about the end of the last great glaciation. Their affinities are more with modern man than with the contemporary Cro-Magnon of Europe. Even at this early time this line of human stock had become subject to dental caries. It appears that the American Negro, despite his mixed origin, is scarcely, if at all, more variable in his vertebral column (Trotter) or in various other physical features (Todd) than is the American white or the African Negro. At the anthropologists' dinner Dr. R. J. Terry, retiring vice-president for Section H, presented a critical summary of results thus far obtained in study of the Negro from various view-points, emphasizing deficiencies in our knowledge and suggesting fields in which extensive work is needed. With his unusual biological and social status, the American Negro offers a unique field for the study of many important problems. A stimulating paper by Aleš Hrdlička led to the appointment of a committee to consider the best means for furthering the ends of American physical anthropology. The time factor with reference to phylogeny was discussed by Bruno Oetteking, and a beautifully organized and graphic presentation showing the evolution of various elements in the human skeleton was given by William K. Gregory. The difficult question of relationship between body build and psychoses was treated conservatively by C. J. Connolly. Mound-builder problems were discussed by Margaret Ashley, and Waldemar Jochelson presented evidence that the Ainu was the aboriginal inhabitant of Japan.

The American Anthropological Association held three independent and three joint sessions on Thursday, Friday and Saturday, with a large attendance. On Thursday morning short papers were presented in which methods and results were emphasized instead of data. M. J. Herskovits spoke on "The Negro in New York: the Statement of a Problem," and E. C. Parsons gave a paper on "Parallels in Pueblo and Plains Cultures." A valuable contribution to the methodology of one of the most controversial of anthropological problems was given by J. H. Steward, "Diffusion *vs.* Independent Invention: a Problem of Logic." In the afternoon a motion picture on "Ethnography of the Jibaros of Alto Amazonas, Ecuador" was shown by the photographer, Professor Carlos Crespi, of the Salesian Fathers. The following officers were elected for 1929:

President, A. M. Tozzer; *vice-presidents*, A. V. Kidder and Diamond Jenness; *secretary*, A. I. Hallowell; *treasurer*, E. W. Gifford; *editor*, R. H. Lowie; *associate editors*, E. W. Gifford and F. G. Speck; *executive committee*, R. W. Benedict, S. K. Lothrop and J. R. Swanton; *representatives in Social Science Research Council*, Edward Sapir and Ralph Linton; *representatives in National Research Council*, A. C. Parker and G. A. Dorsey; *representatives in the Council of the A. A. A. S.*, Bruno Oetteking and H. C. Shetrone.

J. E. Pearce exhibited some remarkably fine specimens of flint chipping from central Texas kitchen-middens. Zelia Nuttall, as a result of her studies on old Mexican documents, suggested that many of the clay figurines from the Valley of Mexico represent ancestors rather than deities. An interesting symposium on "The Formal Interpretation of Art Styles" was opened by Franz Boas, who stated the problems, which comprise the relations of content and technique, representation and style, conventionalization and representation. After several speakers had presented important papers the symposium was summed up by Gladys A. Reichard in a paper entitled "Art Analysis and Specific Problems of Art and Industry." G. F. Kunz presented a paper on "Aboriginal Uses of Gems in North and South America," pointing out that practically all known precious stones, excepting the diamond, and most modern art media, excepting glass and porcelain, were utilized by prehistoric Americans. Friday afternoon was devoted to a joint session with the Linguistic Society of America, with many interesting contributions. This session receives mention in the reports of Section L. A joint session of the Anthropological Association with the Folk-Lore Society occupied Saturday morning, with a series of important and interesting contributions. Stith Thompson spoke upon "Present Folk-Lore Projects of European Scholars." A paper on "Religious Conversion Experiences among the American Negroes" was presented by A. P. Watson. The "Musical Theory of the Pima Indians" was expounded by George Herzog, who stated that songs are considered of supernatural origin, coming, like all knowledge, in dreams. Saturday afternoon was devoted to a joint session with Section H, of the A. A. A. S., the program consisting of a symposium on European Pre-History. G. G. MacCurdy traced the development of the chronology of European prehistoric archeology. Aleš Hrdlička spoke on "Fossil Man in Europe," expressing regret

that the sites of the few important finds are to-day unwatched, although the funds spent on publications discussing the finds might, if employed in researches at these sites, reveal material of the greatest value. A most important paper was that by Ernst Antevs on "Quaternary Climatic Conditions and their Relation to the Peopling of America." A land connection of great extent may be assumed to have existed between Asia and America at almost any time during the Pleistocene, since the sea-level at that time was low enough to expose the bottom of the entire Bering Sea. The last glaciation began about fifty thousand years ago and was at its height thirty-three thousand years ago. From seven thousand to three thousand years ago the conditions for migration and life were even more favorable than now. The address by Franz Boas on "Migrations of Asiatic Races and Cultures to North America," given at a general session of the A. A. A. S., abstracted in SCIENCE for January 25 and appearing in whole in the *Scientific Monthly* for February, was of great interest to many anthropologists. The anthropologists' dinner occurred Saturday evening, at which R. J. Terry, retiring vice-president for Section H, gave an address upon "The American Negro," which has been mentioned above.

The thirtieth general meeting of the Archeological Institute of America was held at The Metropolitan Museum of Art, Thursday, Friday and Saturday. Four meetings were held for the reading of papers, one in connection with the College Art Association. In general the archeological papers represented the results of excavation and research in the various fields covered by the schools of the institute. Lack of space precludes the mention of more than three of the large number of papers presented. T. Leslie Shear reported that the theater at Corinth has now been completely cleared. It is a theater of the Roman period and had an orchestra circle so arranged that it could be used for gladiatorial exhibitions and wild-beast fights. Not far from the theater an early cemetery was discovered, which disclosed numerous vases of an early period. William Bell Dinsmoor reported on supplementary excavations at the entrance to the Acropolis at Athens. The results of these excavations compel a complete revision of our ideas regarding the approach. In the fifth century B. C. there was a wide ascent to the upper level at approximately the place where the monument of Agrippa was afterwards built; beyond this there was a narrower approach, excavated through the rock to the Propylaea. Other very significant finds were reported in this connection. David Moore Robinson reported on the Greek house, as excavated at Olynthus. His excavations give the only information that we have regarding the structure of Greek houses of the fifth and fourth centuries B. C. A unique feature of these Olynthus houses is a large room, perhaps the main living room of the house, with a raised border three or more feet wide and a few inches higher than the central portion. Among the important objects discovered was a bathtub so constructed that its user would be in a sitting posture. In addition to the three papers described above, there were many other papers, most of which added some new detail to our knowledge of archeology. By far the larger number of papers were in the field of Greek archeology, but American archeology, oriental archeology and medieval art were also well represented.

SECTION I (PSYCHOLOGY) AND THE AMERICAN PSYCHOLOGICAL ASSOCIATION

(Reports from Frank N. Freeman and Samuel W. Fernberger)

The annual address of the retiring vice-president of Section I, Dr. Knight Dunlap, was delivered at the joint dinner with Section Q Saturday evening. Dr. Dunlap made a very trenchant criticism of various non-scientific methods in psychology and urged the importance of the laboratory method as the safest basis for progress in the science and for practical applications of the science.

The American Psychological Association, Inc., met at Columbia University on Thursday, Friday and Saturday, with a record registered attendance of 536 members and guests, who represented thirty-four states and six foreign countries. A total of seventy scientific papers were presented in twelve sessions. An analysis of the papers indicates the following distribution with regard to topics: experimental psychology, twelve papers; animal psychology, ten papers; five papers each for theoretical psychology, the psychology of emotion, child psychology, mental tests and measurements, abnormal psychology and educational psychology. Important papers were presented at all these sessions, which were largely attended, and there was an unusual amount of discussion. The association continued the practice of having special sessions for the presentation of informal reports of experimental work by graduate students. Two such sessions were held, with a total of nineteen reports presented. The association this year tried the experiment of organizing formal round-table discussions on topics chosen by previous mail vote of the members. Six such discussions were held on the topics: Clinical psychology, personality, the first course in psychology, consciousness and behavior, the psychophysical measurement methods and esthetics. All were very successful and the round-table method will be continued in future years. An exhibit of psychological apparatus greatly added to the interest of

the meetings. The annual dinner of the association was held Friday evening at the Hotel Pennsylvania and was followed by the presidential address of Professor Edwin G. Boring on "The Psychology of Controversy." At the business meeting on Thursday evening it was voted to merge the 1929 meeting with that of the Ninth International Congress of Psychology, to be held at Yale University in September, 1929, and to omit the regular meeting in December. Dr. K. S. Lashley, of the Institute for Juvenile Research, was elected president and Professor Carl C. Brigham, of Princeton University, was elected secretary.

SECTION K (SOCIAL AND ECONOMIC SCIENCES) AND THE METRIC ASSOCIATION

(Reports from Charles F. Roos and Frederic L. Roberts)

Section K held regular sessions Thursday morning and Friday afternoon and joint sessions Friday morning and Saturday morning with Sections C (Chemistry) and A (Mathematics), respectively. Professor E. B. Wilson presided at both regular meetings. Six papers were presented Thursday morning and four Friday afternoon. On Thursday Dr. A. J. Lotka showed that it is possible to compute by indirect methods from the rate of production of women at different ages and from the mortality of these women and of the children what percentages of these children are left orphans at a given age. By carrying out this procedure twice (namely, on the basis of recent mortality and again upon the basis of the mortality at the beginning of the century) Dr. Lotka concluded that 528,000 children under age seventeen are to-day enjoying the benefits of the parental care of which they would have been deprived (as orphans or half-orphans) under the old mortality. By a study of the British statistics (American statistics are unavailable) he showed that the number of orphans who have lost both father and mother is considerably in excess of the number that would result if the death of the two parents occurred according to the laws applicable to coincidences. In other words, when one parent has died, the life of the other is in more than average danger, the reason probably being that such double disasters happen chiefly in homes suffering from wretched economic conditions.

On Friday Professor Dorothy Thomas criticized techniques used in measuring social behavior and insisted that special attention should be paid to the establishment and standardization of controls. Professor C. F. Roos gave a mathematical criticism of existing scientific methods of forecasting business phenomena to prove that they are unreliable, and showed how a slight variation in interest rate or over-production could cause the price-time relation to change from an exponential to a periodic form. In this connection he exhibited ten different kinds of price-time relations which could result when interest rates or over-production changed slightly. He showed that if it were possible to predict when these changes would occur many of the problems of business forecasting would be comparatively simple.

Professor E. V. Huntington presented an illuminating report on the apportionment of representatives in Congress and demonstrated that only five methods avoided the Alabama and population paradoxes. He explained that only two of these methods (namely, the method of equal proportions and the method of major fractions) were being considered by Congress. Professor Huntington urged the adoption of the method of equal proportions on the grounds that it is the only method which is fair alike to small and large states.

On Friday morning a symposium was held with Section C, to discuss economics and chemical progress. An account of this session is included in the report of Section C. On Saturday morning, at the joint session with Section A, Dr. P. R. Rider developed formulas for the moments of the frequency distribution of third moments of small samples from an infinite population and gave the first and second moments for any type of population and the third and fourth moments for a normal population. Professor C. F. Roos gave a mathematical theory of business fluctuations and assigned a definite theoretical place of measurable importance to the empirical theories of W. C. Mitchell, Irving Fisher, H. L. Moore, E. H. Vogel, L. H. Frank, R. G. Hawtrey, Thorstein Veblen, H. B. Hastings, Gustav Cassell, W. S. Jevons and other economists.

Probably the most important result of the New York meeting of Section K was the forceful demonstration that the social sciences can and are being developed along the exact and scientific lines so well known to the physical sciences.

The inevitable trend toward world-wide metric adoption was definitely indicated at the annual meeting of the Metric Association. Progress in the more general use of metric weights and measures in the United States and requests from metric countries that we take early action to assure metric uniformity, were themes emphasized by the speakers at this most successful meeting. Dr. Arthur E. Kennelly presented some of his findings on the weights and measures of European countries, these findings being the results of a year's research in Europe. They are fully set forth in his book, "Vestiges of Pre-metric Weights and Measures Persisting in Metric System Europe." There was a "Weight and Measure" luncheon and the usual "Metric Dinner." Dr. George F. Kunz was re-

elected president; Theo. H. Miller, Arthur E. Kennelly and Wm. Jay Schieffelin were elected vice-presidents; Howard Richards was elected secretary, and Frederic L. Roberts, treasurer.

SECTION L (HISTORICAL AND PHILOLOGICAL SCIENCES) AND RELATED ORGANIZATIONS

(Reports from Frederick E. Brasch, Roland G. Kent, Joseph W. Hewitt and Helen Mason)

Section L operates as two subsections, one on history of science and the other on linguistics. The New York program for the first of these fields was in the hands of the History of Science Society, which is affiliated with the association. The society took part in two joint sessions, with Section N and the New York Academy of Medicine, with fifteen papers concerning the place medical men have taken in the advancement of science and the contributions made and being made by medical science in the progress of civilization. The papers were presented by men eminent in their respective fields, and they aroused much interest. The program had been arranged by a committee consisting of Lieut.-Col. Fielding H. Garrison (*chairman*), Dr. Frederick P. Reynolds, Dr. Archibald Malloch, Dr. B. Sachs, Dr. R. G. Hoskins (secretary of Section N) and Frederick E. Brasch (secretary of the History of Science Society.)

At the first session Dr. Lindsey R. Williams, director of the Academy of Medicine, spoke on the history and work of the academy. Dr. Lynn T. Thorndike, president of the History of Science Society, discussed the practice of magic in the Middle Ages and in later times. Dr. John C. Hemmeter spoke on "Mutation in Historic Consciousness and the Continuance of Medical Ideas." Dr. Gerald B. Webb called attention to medical men who had contributed to poetry and other forms of artistic literature. Dr. James H. Walsh discussed the part played in the advancement of science by men closely associated with the Roman Catholic Church. Frederick E. Brasch presented a paper on "Medical Men in Mathematics, Astronomy and Physics." At the second session Dr. William H. Welch presented very interesting information on the early teaching of medicine in the United States and on the present teaching of the history of medicine in Europe. Lieutenant-Colonel F. H. Garrison spoke on medical science as related to the advancement of science and civilization. The relation of philosophy and psychology to medicine was discussed by Dr. Morris R. Cohen and by Dr. Joseph Jastrow. Dr. Victor Robinson discussed the contributions of medical science to biology and physiology, and the work of early American physicians in geology was emphasized by Dr. William Browning. Dr. Edward C. Streeter gave a fine account of the relation of medical science to the art of printing. The address of the retiring vice-president for Section L was given at this session by Dr. Harry Elmer Barnes, of Smith College, on "Science *versus* Religion as a Guide to Life," a paper that aroused much controversial discussion in the press. It is planned that the papers of this symposium will appear as a book. The following are the officers of the History of Science Society for 1929: Lynn Thorndike, *president;* Henry Crew and H. W. Tyler, *vice-presidents;* Joseph Mayer, *recording secretary;* F. E. Brasch, *treasurer and corresponding secretary.*

The New York programs on linguistics and related fields were in the hands of the affiliated Linguistic Society of America and of the American Philological Association and the College Art Association of America, both of whose programs were included in the general program this year by special invitation of the American Association for the Advancement of Science. It was especially fortunate that these three organizations were meeting in New York at this time and the American Association is indebted to them for their fine cooperation in its work of rendering the annual meetings adequately representative of all branches of learning.

The special committee on the place of linguistics in the American Association and in American science generally was represented by a paper given by its chairman, Dr. Edward Sapir, at the joint session of the Linguistic Society and the Anthropological Association. Dr. Sapir's title was "The Status of Linguistics as a Science." He considered language as a phenomenon of human behavior and discussed the ramifications of linguistics into other fields of knowledge, pointing out how rigid scientific method can be applied in linguistic investigations. The address was very stimulating and provoked lively discussion. It is to appear in *Language*. The council of the association elected a secretary for each of the two subsections of Section L for the ensuing four-year period. For the subsection on Linguistics and Related Fields, Dr. Leonard Bloomfield is secretary, for the subsection on Historical Sciences, Dr. Joseph Mayer is secretary.

The Linguistic Society of America held five sessions, of which the first three were announced as joint sessions with the linguistic part of Section L, the fourth was a joint session with the Philological Association, and the fifth was a joint session with the Anthropological Association, Section H, and the Linguistic part of Section L. All the sessions were well attended, by from 70 to 150 persons, and the discussion of the papers was lively and profitable. The program consisted of forty-nine papers, of which only ten were read by title only. A gratifying feature of

the program was the appearance of a large number of papers on Americanist topics, and it was obvious that scholars in other parts of the linguistic field followed these with keen interest and drew much benefit from them.

Only a few of the many excellent papers can be mentioned here. N. J. Reich gave reasons for the left-to-right direction of our writing. In Egyptian picture writing chief personages always faced to the right and the artist worked from the face toward the back of the head, consequently running the inscription from right to left. The practical inconvenience of writing toward the left became evident when pictures were given up, for most persons are right-handed, and the direction of writing became from left to right. E. H. Sturtevant pointed out that nouns with stems in ā, plentiful in all divisions of Indo-European, were probably derived by back-formation from verbs. The evidence was based on the phenomena of contract verbs in Hittite, which is not Indo-European but is derived from a still earlier unity from which came both primitive Indo-European and Hittite. Professor Franz Boas spoke on the classification of American Indian languages, showing the overlapping in various linguistic stocks of certain peculiar features, which bring out unusual difficulties. The discussion on this paper was very keen. Professor Franklin Edgerton reported on certain kinds of Prakritic peculiarities in the Veda, showing (from study of a complete but still unpublished corpus of Vedic variations gathered together by the late Maurice Bloomfield) that these Prakritic peculiarities are really of much earlier date than had previously been thought At the Thursday afternoon session held with the Philological Association, Professor Philip K. Hitti presented a valuable communication on Arabic words in English, showing how they came into our language.

At the Friday afternoon session, held with the Anthropological Association, Ephraim Cross spoke on syncope and kindred phenomena in the Roman world, as they bear on the development of the Romance languages, and Truman Michelson discussed some Algonquian phonetic shifts, showing how obscure etymological relations can be cleared up by rigid application of the phonetic laws, tempered by allowances for dialect mixtures. Professor Roland G. Kent spoke of the probable fate of *m* before *t* and *d* in primitive Indo-European, and its bearing on the phonetics of the numeral *nine*.

The newly elected officers of the Linguistic Society are: Charles H. Grandgent, *president;* W. A. Oldfather, *vice-president;* Edward Sapir, *member of the Committee on Publications* (to serve three years).

The American Philological Association met on Thursday, Friday and Saturday, in conjunction with the Archaeological Institute, the College Art Association and the Linguistic Society. The first session, Thursday afternoon, was followed by a visit to the Morgan Library. An evening session with the Archaeological Institute followed, at which Clarence P. Bill, president of the Philological Association, delivered the annual address on "Tracking the Greeks." The evening closed with a very enjoyable and profitable smoker. Five papers were presented Friday morning, among them a discussion by Mark H. Liddell, on "Vocis Flexus in Latin," with interesting illustrations by means of modern physical devices for determining pitch. In the afternoon, among other papers, was one by Harry J. Leon, on "Names of Jews in Ancient Rome," in which a study of 524 different names was reported. Although Greek was the main language of the Jews of Rome they mostly had Latin names. Samuel L. Mohler read a paper on "Roman Public Meals," discussing particularly the money distributed at these meals as tips or favors. The afternoon closed with a visit to the Frick Art Reference Library. A joint banquet of the Philological Association, the Archaeological Institute and the College Art Association was held in the evening, Mr. H. W. Kent, of the Metropolitan Museum of Art, acting as toastmaster. Among the papers read at the Saturday morning session was one by Kenneth Scott, on Octavian's propaganda against his rival Antony, who persisted in identifying himself with the god Dionysos. At the Saturday afternoon session a number of interesting papers were read, among them one by Ben E. Perry, on "Chariton and his Romance from a Literary Point of View." This romance represents a sort of half-way point in the progress from history to pure romance.

The following officers of the Philological Association were elected: *President,* Tenney Frank; *vice-presidents,* Charles B. Gulick and Henry W. Prescott; *secretary-treasurer,* Joseph W. Hewitt; *representative in the American Council of Learned Societies* (four years), W. B. McDaniel.

The eighteenth annual meeting of the College Art Association of America occurred Thursday, Friday and Saturday. Among the papers on the Renaissance, that of D. E. Graves, on Antonio Rosselino, brought forth important new evidence regarding recent forgeries of Italian Renaissance sculpture. The several models upon which Dossena drew in making the forged Renaissance tomb in the Boston Museum were shown, as were many glaring errors in the fabrication of this tomb. Among the papers on the Early Christian period was an important one by T. Whittemore, who discussed recent findings from the excavations of the Cenotaph of Seti I, at Abydos. The anticipated publication of these results by the Egypt

Exploration Society will contribute much important source material for the study of medieval iconography and art. At the joint session of the College Art Association and the Archaeological Institute there were presented, among other interesting papers, a discussion by G. Rowley, on the tooling in trecento pictures. The speaker studied, by means of rubbings, the kinds of tools used and secured information by which the Italian pictures of the thirteenth century may be dated within a decade or two. H. J. Spinden presented results of recent exploration and reconstruction at the ancient Maya cities of Yucatan. The Friday afternoon session was devoted to Far Eastern art and additional evidence was presented on the extended Iranian influence in the art and culture of the Far East during the early centuries of Buddhism. The Middle Ages formed the subject of the Saturday morning session. On Saturday afternoon the session dealt with Mohammedan art. An interesting paper by R. Riefstahl gave information on several new types of buildings discovered by the speaker in Asia Minor and their connections with Mohammedan architecture in other countries.

SECTION M (ENGINEERING)

(Report from N. H. Heck)

Section M held a joint session with Section C on Friday, which is reported under Section C. The Saturday meeting of Section M dealt almost entirely with the subject of research in engineering, particularly emphasizing its relation to industry. The retiring vice-president for the section, Arthur N. Talbot, spoke on research in civil engineering and related fields, pointing out that, while industrial research may be expected to finance itself, research of value to the people as a whole must be supported by government agencies or engineering societies. For the support of some of the more elaborate investigations the Engineering Foundation may secure the support of interested manufacturers or may contribute of its own funds, and control by the foundation insures independence and proper distribution of results. W. E. Wickenden showed that national traditions have a bearing on the development of research, comparing industrial progress with creative engineering work done in the schools in France, England, Germany and the United States. In the United States research in engineering has been of slow growth; in 1924 only about 40 per cent. of the engineering colleges were doing research, but industrial research laboratories have benefited enormously from the research work done in the colleges and they should therefore do more to support such work. C. S. McDowell, in a paper read by P. G. Lauman, brought out the need for greater cooperation between the U. S. Navy and Industry, suggesting the establishment of a naval research reserve. Many researches are of value alike to the navy and to commerce and industry and these might be fostered jointly to the great advantage of both. Clayton H. Sharp presented a paper on some important uses of the photoelectric cell in photometry, illustrating the manner in which the work of the physicist has become of fundamental importance to the work of the engineer.

Michael I. Pupin spoke at the engineers' luncheon Saturday, stating that the cultivation of the three M's (*motive* of unselfishness, unprejudiced *mental* attitude and *method* of work) fostered by university professors has instilled a spirit of idealism into both industrial and university research laboratories. The speaker expressed the hope that with an engineer in the White House, the three M's might be applied also to the science of government. The Baron Shiba motion pictures showing airplane research were received with great interest. In the symposium on "Organization of Scientific Research in Industry," Frank B. Jewett discussed the difficulty of obtaining competent men for leadership in either research or administrative work, men in whom the love of the work is greater than the desire for wealth and power. Willis R. Whitney discussed the need of encouraging competent men to continue in research, pointing out that the small salaries usually paid research workers discourage the more ambitious young men. L. V. Redman presented a paper on the economic aspects of research, pointing out that, while returns on investments in research projects are usually very slow for the first few years, these returns are ample in the long run. A research institution or organization to be self-supporting would need to have many researches going on at the same time, all in different states of development, so that there might always be at least one to be paying profits.

SECTION N (MEDICAL SCIENCES)

(Report from R. G. Hoskins)

On Thursday afternoon Section N participated with Section C in a joint symposium on the "Chemistry of Certain Active Principles on Plant and Animal Origin," which has received attention in the report of Section C. On Friday afternoon and Saturday forenoon a joint symposium was held with the History of Science Society and the New York Academy of Medicine, on the "History of Science as Related to Medicine." These meetings were largely attended and a variety of papers on the outstanding contributions of physicians to the advancement of civilization were followed with close interest. Monday forenoon was devoted to a symposium on the

broad topic of "Variability of Life Cycles," with special reference to the possibilities of influencing favorably the human life cycle in the direction of increased longevity. The program had been arranged under the joint auspices of the Life Extension Institute and Section N. Dr. Lyman Fisk emphasized the lack of acceptable evidence that the human life span is intrinsically limited to the conventionally accepted "three score years and ten." Professor D. T. MacDougal discussed some of the physiological features of plant cells that persist in an active state for long periods—even for centuries. Dr. L. V. Heilbrunn presented some of the results of his studies on acclimatization, pointing out that the physiological efficiency of organisms living under tropical conditions is conditioned by the melting point of assimilated fats. He suggested that dietary practices leading to the substitution of high melting for low melting fats would probably add materially to the efficiency of people moving from temperate to tropical regions. That Professor W. W. Swingle was prevented by illness from presenting his paper on the significance of hormone factors was generally regretted. Running throughout the discussions was the hopeful note that future researches may well add materially to the prolongation of human life and efficiency. The address of the retiring vice-president for Section N, Dr. G. Canby Robinson, presented at the Monday meeting, was a penetrating and systematic discussion of many phases of the application of science in the practice of medicine.

SECTION O (AGRICULTURE) AND RELATED ORGANIZATIONS

(Reports from P. E. Brown, Ward Shepard, Harold B. Tukey, A. L. Stone and C. M. Woodworth)

The joint program of Section O with the New England Section of the American Society of Agronomy consisted of a symposium on "Pasture Management Research." The papers presented dealt with a great variety of topics such as the comparative returns in feed units from crop rotations and from pastures, the income from land in crops and in pasture, the conditions determining the most productive pastures, ecological factors determining pasture floras, etc. At the annual dinner of Section O with the New England section of the Society of Agronomy, L. E. Call gave the retiring vice-presidential address on "Increased Efficiency of American Agriculture" and there were talks on English pastures and green pastures, and a film on pasture work was shown. Dean Call's address has been publised in SCIENCE for January 18.

The Society of American Foresters met on Friday and Saturday with an attendance of about two hundred. There were many vigorous discussions of major forestry problems, and a number of important announcements for the future of the society were made. The program dealt in considerable measure with economic and public problems confronting forestry practice. President O. M. Butler, in his challenging address on "Battle-Fronts of Forestry," emphasized the need for advance in many fields of forestry. His address, together with many of the other papers given at New York and abstracts of the discussions, will be published in the *Journal of Forestry*.

Announcement was made of a gift of $30,000 from the Carnegie Corporation to the society, to finance a survey of important problems in forest education. Another important step taken at this meeting was the adoption of a resolution authorizing a committee of the society to "consider the problems presented in maintaining the productivity of the forest lands of the United States" and to propose programs for maintaining the productivity of those lands. Through an anonymous gift announced at New York, the Society of American Foresters is to award a first prize of $1,000 and a second prize of $250 for plans proposed for the solution of the forest problem, members and fellows of the society being eligible. Plans must be limited to 2,000 words. The complete details will soon be announced. The executive council of the society was asked to formulate a plan for the maintenance of a permanent forester-secretary.

The American Society for Horticultural Science held its twenty-fifth annual meeting from Thursday to Saturday. The attendance was larger and more representative than at any previous meeting and the number of papers exceeded that on any previous program. The meeting was characterized by excellent contributions upon a wide range of subjects, one noticeable trend being towards an increased interest in propagation and congeniality problems and a somewhat lessened interest in nutrition studies, which have dominated the programs of recent years. Vegetable problems continue to increase in relative importance. Thursday forenoon was devoted largely to genetics, with eleven papers on breeding, pollination, etc. The Thursday afternoon and Friday morning programs were each presented as two sessions, on pomology and on vegetable gardening. Twenty-seven papers on pomology and twenty-three on vegetable gardening were read. Thirty-five reports of general interest were given on Friday afternoon and Saturday. The address of the president, C. P. Close, was given at the horticulturists' dinner Friday evening, the subject being "What Twenty-Five Years have Wrought in American Horticulture."

The Association of Official Seed Analysts of North America held its annual meeting from December 31,

1928, to January 3, 1929, which was notable for unusually large attendance and for the number and excellence of the papers presented. Some of the prominent features were papers on: "Physiology of Seed Germination," by William Crocker; "The Interpretation of Statistical Data of Seed Analysts," by G. N. Collins, and the address of the president, E. H. Toole, on "Ideals and Seed Testing." Reports were received from delegates who attended the International Seed Testing Congress at Rome in 1928, and round-table discussions were held on many topics of general interest. Ellen Emack presented data to show that changes in the weights and compositions of the component parts of a seed sample during the analysis were not always insignificant, varying with the kind and character of the seed, and she emphasized the necessity for care in the handling of seed samples. A paper by Mary Woodbridge showed that in a sample of seed of orchard grass spikelets and portions of spikelets may be of several forms, some consisting entirely of ripened florets, while others included some ripened and some empty florets, and the proportions of these may render the purity determination difficult. The incorporation of disease diagnosis in seed-analysis reports was shown by A. G. Johnson to be possible and practicable. Many other papers of great interest were presented.

The Geneticists Interested in Agriculture held a joint session on Thursday afternoon with the Genetics Sections of the Society of Zoologists and the Botanical Society. The program was a symposium on "Inheritance of Disease Resistance in Plants and Animals." H. K. Hayes led the discussion for plants, L. J. Cole led that for animals and E. W. Lindstrom, R. J. Garber, Fred Richey, C. C. Little, H. J. Muller, R. A. Brink, M. R. Irwin, I. E. Melhus and others took active part, giving their impressions and the results of their own investigations. H. L. Ibsen was elected secretary *ad interim*.

SECTION Q (EDUCATION)

(Report from A. S. Barr)

Section Q held seven sessions at New York, one devoted to each of the following topics: the experimental study of elementary education, educational research in higher institutions, educational psychology, measurements and scientific techniques, social aspects of education and research in public school systems, and one to the retiring vice-presidential addresses for Sections I and Q. About fifty papers were presented altogether. Among the speakers were Leonard, Gray, Toops, Gesell, Thurstone, Lincoln, McGaughy, Dearborn, Kelley, Thorndike, Courtis, Pechstein, Symonds, May, Wood, Coxe, Kallom, Connor, Witham, Boyer, Stenquist, Wallin, Dunlap and Gates. The papers were excellent in quality, the attendance was good and a great variety of topics were discussed. Sixteen papers dealt with experimental studies on teaching and learning, twelve dealt with measurements and scientific technique of various sorts, nine papers dealt with research in higher institutions, eight dealt with social aspects of education, six dealt with elementary education and two reported laboratory and case studies. Many of the papers will appear in *The Journal of Educational Research, The Journal of Educational Psychology* or in *School and Society*.

ORGANIZATIONS RELATED TO THE AMERICAN ASSOCIATION AS A WHOLE

(Reports from Edward Ellery, Sidney M. Cadwell and Josephine B. Glasgow)

The Society of the Sigma Xi held its twenty-ninth convention on Friday with thirty-one chapters and three clubs represented. The president reported that the society consists now of fifty chapters and seventeen clubs. The secretary reported that in the year just closing 757 members and 828 associates had been initiated in the chapters and that the total membership of the society is now over 22,000. The treasurer reported total receipts for the year amounting to $10,274.70 and total disbursements amounting to $10,019.44. The officers elected are: *President,* F. R. Moulton; *Member of Executive Committee* (for five years), F. E. Lloyd; *Member of Alumni Committee* (for five years), C. F. Hirshfeld. The annual Sigma Xi dinner was held in Flying Bird Hall of the American Museum and was attended by nearly four hundred members and guests. The seventh annual Sigma Xi lecture was given at the general session Thursday evening, by Prof. Arthur Compton, on "What is Light?"

Ninety-one members of the Gamma Alpha Graduate Scientific Fraternity met for breakfast at the Lincoln Hotel on the morning of December 29, at which reports from the chapters were presented. After the breakfast a visit was made to the Bell Telephone Laboratories, where a demonstration of television was provided and opportunity was given to inspect the apparatus and laboratories.

The Sigma Delta Epsilon Graduate Women's Scientific Fraternity held its seventh annual convention following a breakfast on Saturday morning, with about fifty members present. The national officers elected for 1929 are: *President,* Stella Mary Hague; *vice-presidents,* Elda Wahler and Edna Mosher; *secretary,* Helen Jean Brown; *treasurer,* Rachel Edgar. For a breakfast on Friday morning, invitations were

extended to all women interested in science and about eighty were present, representing thirty-seven institutions. Lua A. Minns told of the history of the organization, and Rosalie Slaughter Morton spoke briefly of her hospital experiences in southeastern Europe. Regina S. Riker spoke on the "Opportunities for Women in Science in Western Europe."

SCIENTIFIC EVENTS

MEMORIAL TO PROFESSORS BAYLISS AND STARLING

PROFESSOR C. LOVATT EVANS, F.R.S., of University College, London, the secretary and treasurer of the fund to provide a fitting memorial to the late Professors Sir William M. Bayliss and Ernest H. Starling, of University College, London, writes that the committee wishes to express its deep feeling of gratitude to the American workers who have contributed very generously to this fund, and to inform them that the objects which the committee had in view will be capable of realization. The sum raised will, with interest, have reached over £2,600 up to the end of January, and it will be interesting to all American physiologists to know the purpose to which it has been decided to apply the fund.

A small part has been employed in the preparation of a simple memorial tablet bearing the words:

WILLIAM MADDOCK BAYLISS, F.R.S.,
1860 1924

ERNEST HENRY STARLING, F.R.S.,
1866 1927

This tablet will be placed in the entrance hall of the physiological department above the bust of William Sharpey. Almost the whole of the sum, however, will be transferred to the University of London to be held in trust for University College for the creation of a Bayliss and Starling Studentship for the purpose of enabling a selected person from any university to acquire a knowledge of physiology and biochemistry as a preliminary to undertaking research work in those subjects. The governing body of University College has offered to assist the scholarship in a very material way by remitting all fees for instruction payable by the selected candidate, so that practically the whole of the interest on the money will be available for the payment of a selected scholar.

THE CENTENARY OF THE ZOOLOGICAL SOCIETY OF LONDON

ALTHOUGH, as pointed out in the London *Times*, the Zoological Society of London was founded in 1826, and there were animals on public view in the Gardens in Regent's Park before the end of that year, it was not until 1829 that a Royal Charter was granted. The council accordingly decided to celebrate the centenary this year. The full arrangements have not yet been made, but it is anticipated that the annual general meeting on April 29 will be attended by representatives of other societies in this country and abroad. It is also proposed to hold an evening reception for the 8,000 odd fellows and their guests in the gardens on an evening in the middle of summer.

The secretary of the society is preparing a history for publication during the year in which the origin and the more important events in the general and scientific work of the society will be described. Although there have been ups and downs in prosperity, the general trend has been towards progress, especially in the last 25 years, notwithstanding the intervention of the Great War, which arrested all progress for a time. Last year was the most prosperous in the whole history of the gardens in respect of the number of visitors, revenue and general activity.

In connection with the centenary a special work of considerable general and scientific interest is in active preparation. This consists of a list of every species of mammal, bird, reptile, batrachian and fish that has been exhibited alive in the garden since their foundation. The correct scientific name, the various synonyms and local or popular names for each species will be given, as well as references to the proper scientific description and to published figures where these can be found. It is hoped that this list will be of general utility and will serve to prevent much confusion of terminology. Major Stanley S. Flower has undertaken the mammals and reptiles, Dr. G. C. Low the birds, Dr. Malcolm Smith the batrachians and Mr. E. G. Boulenger the fishes.

THE PROTECTION OF NIAGARA FALLS

ANNOUNCEMENT of the signing of the convention between the United States and Canada to protect the scenic beauty of Niagara Falls was made at the Department of State on January 3. It was accompanied by a brief explanation that the proposed remedial works follow closely recommendations made by the special International Niagara Falls Board, composed of prominent American and Canadian engineers, created by the two governments in 1926 to make a close study of what steps should be taken jointly by the United States and Canada to preserve the falls. In addition to the proposed protective works, the convention authorizes a temporary diversion of an additional amount of water on each side of the boundary not to exceed 20,000 cubic feet a second for the purpose of determining the efficiency of the remedial works to accomplish the purposes for which they are to be constructed.