SPECIAL ISSUE CONTAINING REPORTS OF THE FOURTH CLEVELAND MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE AND ASSOCIATED SOCIETIES. EDITED BY BURTON E. LIVINGSTON, PERMANENT SECRETARY.

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THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

REPORTS OF THE FOURTH CLEVELAND MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE AND ASSOCIATED SOCIETIES

GENERAL FEATURES

THE fourth Cleveland meeting of the American Association was held from Monday, December 29, 1930, to Saturday, January 3, 1931. This was the eighty-seventh meeting of the association. Earlier Cleveland meetings were in July, 1853 (when the association was only five years old); in August, 1888; and in convocation week, 1912–13. The preliminary announcement of the fourth Cleveland meeting appeared in a special issue of SCIENCE for November 28, 1930, and the general program was published at Cleveland on Monday, December 29. Copies of the program may be secured free from the Washington office of the association.

The sessions for the natural and exact sciences were held mainly in the rooms of Western Reserve University and the Case School of Applied Science. The societies in the field of the social and economic sciences held their sessions in the hotels. These made their own local arrangements and operated their own registration offices, but the other organizations cooperated cordially with the association in the usual manner. The facilities were excellent and the meeting was successful in every way.

The president for this Cleveland meeting was Thomas H. Morgan, of the California Institute of Technology, eminent zoologist and a leading authority in the field of genetics. The retiring president was Robert A. Millikan, of the California Institute of Technology, leader in physical research and in the scientific education of the public. Dr. Millikan's retiring presidential address was given at the opening session of the meeting, on Monday evening, December 29, before an audience of over 3,000 people that filled the Cleveland Music Hall. Several hundred late comers were unfortunately unable to enter the hall. This

was the largest audience ever assembled for an opening session of the American Association. Dr. Millikan spoke on "Atomic Disintegration and Atomic Synthesis." His address has been published in SCIENCE for January 2, 1931.

REGISTRATION

Two thousand six hundred and thirty-five persons registered at the association's registration offices, in the gymnasium of Western Reserve University, and we are informed by the Cleveland Convention Board that 2,123 persons registered in the downtown hotels for the sessions devoted to the social and economic sciences and related fields. The total registration for all these meetings was therefore 4,758, of which number 413 represents people residing in Cleveland. There were of course many who attended some lectures or sessions who failed to register in either group of organizations. The residence distribution of those who registered with the American Association for the Advancement of Science is shown by the accompanying list. Altogether the attendance at Cleveland may be safely estimated as well above 5,000.

About 300 scientific sessions are shown in the American Association's General Program for this meeting, which also shows about 1,830 papers and addresses, given by about 2,090 authors; many contributions were by two or more joint authors. The papers were distributed among the sciences approximately as follows: Mathematics, 102; physics, 100; chemistry, 14; astronomy, 22; geology and geography, 23; zoology, 428; botany, 279; ecology, genetics, etc., 158; anthropology, 68; psychology, 22; social and economic sciences, 257 (not all these programs were made available for printing in the general program); historical and philological sciences, 13; engineering, 10; medical sciences, 5; agricultural sciences, 232; education, 43; science in general, 26. Many society dinners, luncheons and smokers were held, with excellent attendance.

REGISTRATION AT THE OFFICES OF THE A. A. A. S. BY STATES AND PROVINCES

Alabama	6	Florida	18
Arizona	7	Georgia	13
Arkansas	3	Idaho	1
Australia	1	Illinois	155
California	42	India	1
Chile	1	Indiana	75
China	2	Iowa	62
Colorado	13	Kansas	23
Connecticut	40	Kentucky	28
Cuba	2	Louisiana	19
Czechoslovakia	1	Maine	12
Delaware	10	Manitoba	4
District of Columbia	104	Maryland	47
England	3	Massachusetts	105
Michigan	153	Pennsylvania	203
Minnesota	47	Poland	1
Mississippi	15	Porto Rico	3
Missouri	67	Quebec	7
Montana	5	Rhode Island	16
Nebraska	16	Russia	3
New Brunswick	1	South Carolina	12
Newfoundland	1	South Dakota	2
New Hampshire	11	Switzerland	1
New Jersey	55	Tennessee	25
New Mexico	2	Texas	24
New York	318	Utah	4
North Carolina	17	Vermont	5
North Dakota	6	Virginia	36
Ohio (Cleveland excluded)	348	Washington	9
Cleveland	252	West Virginia	28
Oklahoma	21	Wisconsin	83
Ontario	32	Wyoming	5
Oregon	3	Total	2,635

THE CLEVELAND COMMITTEES

The general local committee on arrangements was unusually efficient this year. The committee was not organized till very late and most of the preparations were accomplished in the two months preceding the meeting, with the very active and able leadership of Dr. Harry W. Mountcastle, of Western Reserve University. The permanent secretary has learned of no serious complaints or criticisms of the work of the general committee or its subcommittees, which indicates that the members of the numerous organizations and groups were generally very well satisfied. To the members of the general committee and the subcommittees and to the local representatives of the association sections the American Association and all the societies that met with it are deeply and lastingly grateful. The personnel of the general committee is shown below.

THE GENERAL LOCAL COMMITTEE

ROBERT E. VINSON, *honorary chairman;* Western Reserve University.

WILLIAM E. WICKENDEN, *honorary vice-chairman;* Case School of Applied Science.

HARRY W. MOUNTCASTLE, *general chairman of the local committee and chairman of the special committee on meeting places;* Western Reserve University.

SIDNEY S. WILSON, *chairman of the special committee on finance;* Western Reserve University.

WINFRED G. LEUTNER, *chairman of the special committee on transportation, hotels, registration and communication;* Western Reserve University.

DAYTON C. MILLER, *chairman of the special committee on general sessions and public lectures;* Case School of Applied Science.

HOWARD T. KARSNER, *chairman of the special committee on entertainment;* Western Reserve University.

THEODORE M. FOCKE, *chairman of the special committee on equipment;* Case School of Applied Science.

HENRY B. DATES, *chairman of the special committee on exhibitions;* Case School of Applied Science.

J. PAUL VISSCHER, *chairman of the special committee on luncheons and dinners;* Western Reserve University.

CHARLES F. CHAPMAN, *chairman of the special committee on press relations;* Case School of Applied Science.

ORGANIZATIONS THAT MET IN CLEVELAND[1]

GROUPED ACCORDING TO THE ASSOCIATION SECTIONS

Section A (Mathematics). **American Mathematical Society. **Mathematical Association of America.

Section B (Physics). *American Physical Society. *American Meteorological Society.

Section C (Chemistry). Cleveland Section, American Chemical Society.

Section D (Astronomy). No other organizations.

Section E (Geology and Geography). No other organization.

Section F (Zoological Sciences). **American Society of Zoologists. **Entomological Society of America. **American Association of Economic Entomologists. ** American Society of Parasitologists. †Wilson Ornithological Club.

Section G (Botanical Sciences). **Botanical Society of America. **American Phytopathological Society. **American Society of Plant Physiologists.

Related to Sections F and G. **American Society of Naturalists. **Ecological Society of America. **American Microscopical Society. †Phi Sigma Biological Research Society. Genetics Sections, American Society of Zoologists and Botanical Society of America.

Section H (Anthropology). **American Anthropological Association. †American Folk-Lore Society. American Association of Physical Anthropologists.

Section I (Psychology). No other organizations.

Section K (Social and Economic Sciences). †American Statistical Association. †American Sociological Society. †American Economic Association. †Metric Association. American Political Science Association. American Farm Economic Association. American Association for Labor Legislation. American Association of University Instructors in Accounting. American Association of Teachers of Law in Collegiate Schools of Business. Stable Money Association.

Section L (Historical and Philological Sciences). **History of Science Society.

Section M (Engineering). No other organizations.

Section N (Medical Sciences). American Society of Tropical Medicine.

Section O (Agriculture). **American Society of Agronomy. *American Society for Horticultural Science. †Association of Official Seed Analysts of North America. †Potato Association of America. Geneticists Interested in Agriculture. Crop Protection Institute.

Section Q (Educational). No other organizations.

[1] Officially associated organizations that are affiliated with the American Association are designated by one or two asterisks (showing that they each have one or two representatives in the association council, respectively). Other officially associated organizations are each designated by a dagger.

Related to A. A. A. S. as a whole. **Society of the Sigma Xi. **American Association of University Professors. *American Nature-Study Society. †Gamma Alpha Graduate Scientific Fraternity. Sigma Delta Epsilon Graduate Women's Scientific Fraternity.

THE GENERAL PROGRAM

The General Program of the fourth Cleveland meeting is a book of 341 pages, containing the usual program material. Copies may be secured free by writing to the Washington office of the association.

The excellence of this important publication is due largely to Dr. Sam F. Trelease, program editor, and Mrs. Helen M. Trelease, who devoted themselves mainly to this work from about the middle of November and gave full time to it after December 13.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE PRESS SERVICE

(By Austin H. Clark, director of the Press Service)

The work of the Press Service at the Cleveland meeting was very greatly facilitated by the promptness with which those who were to give papers sent in their manuscripts, and especially by the way the papers were written and the abstracts prepared. For two weeks or more before the meeting the papers are studied by a number of representatives of the press in Washington, and a large proportion of the press accounts of the meeting are prepared at that time, being sent out from Washington to be released on the proper day. In this way far more attention can be devoted to the preparation of the press accounts than is possible during the week of the meeting, when everything must be done in more or less of a hurry; and furthermore it is possible to send the press accounts to papers all over the country by mail, thus saving telegraph charges. In addition to all this, the press representatives working in Washington on material submitted well in advance have within easy reach by telephone authorities on almost every subject, who are able to explain any points that may not be quite clear. This permits the use of many papers or abstracts that could not possibly be noticed during the rush of the meeting. It also insures greater accuracy and more satisfactory work generally on the part of the press representatives.

Perhaps it is not yet generally realized among those who take part in the scientific programs of these meetings that the press representatives do not attend sessions or listen to the reading of papers unless something more or less out of the ordinary is expected. They depend almost entirely upon the material sent to the Press Service in advance, and on interviews. Therefore if the manuscript of an address or contribution has not been available beforehand and is not

available in the press room at the meeting, that particular contribution does not exist so far as the press is concerned. It is manifestly impossible for the press representatives to hear any but a very small fraction of the many papers presented and a proper selection of the particular sessions to be attended is rendered very difficult by the fact that alluring titles sometimes are used in the program for papers of little news value, while far more frequently papers with very considerable news value appear in the program under highly technical and most formidable titles. So the press representatives, when they listen to papers at all, always select those of which they have some previous knowledge, through having seen copies or abstracts in the press room at the meeting or earlier in Washington.

It is very important that complete copies of all the addresses and papers to be delivered be sent to the director of the Press Service as long in advance as possible. An abstract alone is not sufficient, for the simple reason that its necessary brevity renders it too inflexible to serve as the basis of an adequate newspaper account. It is obvious that a newspaper article of two or three columns compiled from abstracts of papers in many different lines of science would make most uninspiring reading. Yet a skilful writer with the same abstracts accompanied by the complete papers can write a most fascinating story covering exactly the same ground—and the stories of no two writers working over the material would be alike. But abstracts are needed, to call attention to the main points brought out in the papers and to state these points clearly and concisely, so that any person with a moderate degree of intelligence and a reasonable education can understand.

In spite of their brevity—and because of it—good abstracts are much more difficult to write than good technical papers. In preparing an abstract of your paper a good idea is to imagine that you are anxious to make a deep impression on the fourteen-year-old son of some influential person who might aid your work. Or you might persuade some one with an ordinary high-school education, or perhaps less, and with no special knowledge of your subject, to listen to a recital of the main points in your paper and then tell you what impression you have made. Perhaps some point which you know to be quite insignificant may remain uppermost in the mind of your listener. If this be the case, that point, no matter how trivial it may appear to you, might well be the main theme of the abstract. Using that as an introduction you develop it in such a way as to work into the abstract what you know to be the really important part of your paper.

The reporting of the association's meetings would be greatly facilitated if each secretary of the sections and societies might get his program completed early enough to permit him to prepare or get prepared a general, non-technical account of the forthcoming sessions and if such accounts might be sent to the Press Service two or three weeks before the meeting. These accounts should point out present trends in the several lines of science as evidenced by the programs, calling attention to the outstanding and especially interesting papers. Excellent advance notices of this sort from the Phytopathological Society have shown the great value of such work. Advance accounts of the society programs would also greatly facilitate the preparation of the general reports of our meetings for publication in SCIENCE.

From the point of view of the Press Service the Cleveland meeting was the most successful we have held thus far. This was very largely due to the local committee on press relations, consisting of Mr. Charles F. Chapman, of the Case School of Applied Science (*chairman*); Miss Marie Kirkwood, of Western Reserve University, and Mr. Stanley Friedman, of the Brush Foundation. This committee arranged for extensive and most excellent advance press notice, and was constantly on hand during the entire week of the meeting. So efficiently was their work done that everything moved with unprecedented smoothness; at no time was there any of the confusion which has been experienced heretofore, especially on the first two days of a meeting. Mr. Watson Davis and the other members of the staff of Science Service gave the Press Service of the association the most cordial cooperation and rendered invaluable assistance, much of which was volunteered. There was nothing that they could possibly do which was left undone.

THE SCIENCE EXHIBITION

The Cleveland exhibition was housed in the gymnasium of Western Reserve University, where the registration offices were also located. It was the most successful exhibition yet held by the association. The commercial exhibits were again in charge of Colonel H. S. Kimberly, director of the exhibition. A special committee, of which Dr. F. C. Brown, of the Museum of Science and Industry, New York City, is chairman and Mr. Owen Cattell, of The Science Press, is secretary, arranged a fine display of research exhibits. These exhibits added very much to the value and attractiveness of the exhibition. Professor Henry B. Dates, of the Case School of Applied Science, was chairman of the local committee on exhibits. To him and his colleagues the association and the societies are greatly indebted.

Afternoon tea was served at the exhibition, as in previous years. An annotated list of the exhibits displayed at Cleveland is given in the general program, occupying seven pages. To the many exhibitors, who made the exhibition possible, the permanent secretary is glad to express the appreciative thanks of the association.

THE ASSOCIATION PRIZE

The eighth award of the American Association prize of $1,000 was made on January 3 to Messrs. M. A. Tuve, L. R. Hafstad and O. Dahl, of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington, for their paper entitled "Experiments with High-Voltage Tubes," presented before Section B (Physics) and the American Physical Society. This prize is awarded annually to the author of a noteworthy contribution to science presented at the annual meeting and shown in the general program.

The American Association for the Advancement of Science is able to make these annual prize awards through the generosity of a member who prefers to remain anonymous. A list of the names of those to whom the prize has been awarded is shown below, together with the topics dealt with in the winning papers.

(1) The Cincinnati award, January, 1924. L. E. Dickson, for contributions to the theory of numbers.
(2) The Washington award, January, 1925. Divided equally between Dr. Edwin P. Hubble, for contributions on spiral nebulae, and Dr. L. R. Cleveland, for contributions on the physiology of termites and their intestinal protozoa.
(3) The Kansas City award, January, 1926. Dr. Dayton C. Miller, for contributions on the ether-drift experiment.
(4) The Philadelphia award, January, 1927. Dr. George D. Birkhoff, for mathematical criticism of some physical theories.
(5) The Nashville award, January, 1928. H. J. Muller, for contributions on the influence of x-rays on genes and chromosomes.
(6) The New York award, January, 1929. Oliver Kamm, for contributions on the hormones of the pituitary gland.
(7) The Des Moines award, January, 1930. A. J. Dempster, for contributions on the reflection of protons from a calcite crystal.
(8) The Cleveland award, January, 1931. M. A. Tuve, L. R. Hafstad and O. Dahl, for contributions on the production of beta rays and gamma rays by means of high-voltage vacuum-tubes.

The permanent secretary is indebted to Mr. John A. Fleming, acting director of the Department of Research in Terrestrial Magnetism of the Carnegie Institution of Washington, for the following note on the prize paper.

The paper reported the artificial production of two of the three types of rays emitted by radium, namely, the beta-rays—very high-speed electrons—and the gamma-rays—very penetrating x-rays—by the application of potentials up to approximately 2,000,000 volts, produced by the familiarly known Tesla coil, to specially developed vacuum-tubes capable of withstanding this tremendous voltage. Measurements of the deflection of the beta-rays produced by the tubes in a calibrated magnetic field showed that the fastest beta-rays had speeds corresponding to the peak-voltages applied to the tubes, thus verifying the voltage-measurements. The gamma-rays from the tubes were measured through one, two and three inches of lead, and with the tube operated at a peak-voltage of 1,300,000 volts their penetrating-power or absorption-coefficient was found to be the same as that of the gamma-rays from radium measured under the same conditions.

The identity of the gamma-rays from the tubes with the rays used in the therapeutic applications of radium has aroused a considerable interest in the possible medical applications of high-voltage tubes. The equipment as at present used in the laboratory of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington produces the equivalent of a very large quantity of radium but only for an extremely short period of time, the operation of the tube being intermittent. Due to the limitations of small-sized electrical equipment and to the lack of necessity for large intensities of radiation for the physical measurements, as well as the personal risk to the experimenters themselves from heavy exposures to the rays, no particular effort has been made to increase the total intensity of the radiation. If large intensities of gamma-rays, comparable to very large amounts of radiation, are desirable for medical purposes, it is so far as can be foreseen chiefly a matter of the provision of the necessary equipment.

The present equipment at the laboratory of the Carnegie Institution, of small power but giving very high voltages, was developed for investigations related to atomic physics rather than to medicine. The general aim of the work looks toward investigations of the innermost structure of the atom, the atomic nucleus, probably along the lines of investigation initiated by Sir Ernest Rutherford and his colleagues using the rays emitted by radium and other radio-active substances. For this purpose it is thought especially important to extend the investigations to voltages well beyond the energy-equivalents of the natural rays from radium. Study of the atomic nucleus provides an opportunity for learning more nearly the true nature of the laws which underlie the whole material universe.

THE GENERAL SESSIONS

As in recent years, there were many general sessions at Cleveland. General sessions are planned to be sufficiently non-technical to interest men and women of science in all lines and usually the general public as well.

The opening session, Monday evening, December 29, was held in the Music Hall of the Public Audi-

torium. It was opened by Dr. Harry W. Mountcastle, general chairman of the Cleveland committee on arrangements. After brief addresses of welcome by Dr. Robert E. Vinson, president of Western Reserve University, Dr. William E. Wickenden, president of the Case School of Applied Science, and Mr. John D. Marshall, mayor of Cleveland, the chair was taken by President Thomas H. Morgan, who replied on behalf of the association and then introduced the main speaker of the evening, Retiring President Robert A. Millikan. Dr. Millikan's address was on "Atomic Disintegration and Atomic Synthesis." It has appeared in SCIENCE for January 2, 1931.

The opening session was followed by the general reception, given by the local committee to the men and women of science and their friends. This occurred in the ballroom of the Public Auditorium. Both the opening session and the reception were unusually well attended.

On Tuesday afternoon, December 30, there were two general sessions. A session of the American Association's committee of one hundred on research and invited guests was devoted to discussions of the problems of the committee, concerning what may be termed the general environment of research workers in America. This program was in charge of Dr. Rodney H. True, of the University of Pennsylvania, secretary of the committee of one hundred. President Morgan presided.

The eighth annual Josiah Willard Gibbs lecture was presented on Tuesday afternoon, under the auspices of the American Mathematical Society. The lecturer was Dr. Edwin B. Wilson, of the Harvard University School of Public Health. He spoke on "Reminiscences of Gibbs by a Student and Colleague."

The general session on Tuesday evening was devoted to the ninth annual Sigma Xi lecture, given under the auspices of the Society of the Sigma Xi. The lecturer was Dr. C. E. K. Mees, of the Eastman Kodak Company, who spoke, with illustrations, on "The Science of Photography."

There were two general sessions on Wednesday afternoon. One of these was devoted to a program of nineteen invited papers on hydrobiology and aquiculture ("Water Farming"), arranged by Dr. James G. Needham, of Cornell University. The chairman for this session was Dr. E. A. Birge, of the University of Wisconsin. The papers ranged over a very broad field, from phytoplankton to fishes. They were mainly ecological in point of view and most of them dealt primarily with animals. At the other general session held on Wednesday afternoon Dr. Aleš Hrdlička gave a very interesting lecture on "Animal-like Manifestations of the Human Child."

The Wednesday evening general session was devoted to an illustrated lecture by Mr. Roger Lowell Putnam, trustee of the Lowell Observatory, Flagstaff, and Dr. V. M. Slipher, director of the Lowell Observatory. This was presented by Mr. Putnam. Its title was "Searching Out Pluto, Lowell's Trans-Neptunian Planet."

On Thursday afternoon Dr. W. H. Longley, of Goucher College, Baltimore, gave an illustrated non-technical lecture on "The Habits of Certain Fishes of the Dry Tortugas, Florida." He dealt largely with behavior reactions of the fishes inhabiting tropical reefs.

The general session on Thursday evening was devoted to an illustrated lecture on "Prehistoric Human Culture in the Southwestern United States," given by Dr. Frank H. H. Roberts, of the Bureau of American Ethnology, Smithsonian Institution.

The Cleveland series of general sessions was terminated on Friday evening, January 2, by an illustrated non-technical lecture on "Weighing the Earth," given by Dr. Paul R. Heyl, of the U. S. Bureau of Standards. The weight is actually about six thousand million million million tons, and Dr. Heyl showed how this has been ascertained.

BUSINESS PROCEEDINGS OF THE COUNCIL AND EXECUTIVE COMMITTEE AT CLEVELAND

The executive committee met on Monday morning, December 29, and the council met in the afternoon of the same day. The council held sessions on Tuesday, Wednesday and Thursday at 9 o'clock and the executive committee held a session immediately following each of these council sessions. The following items of business were transacted.

(1) The permanent secretary announced that Dr. Charles A. Shull had been appointed by the executive committee to fill the vacancy created by the resignation of Dr. Sam F. Trelease as secretary of the council.

(2) The minutes of the final council session at Des Moines were read and approved.

(3) The minutes of all Cleveland council sessions excepting the final one were read and approved.

(4) The permanent secretary announced that Mr. A. E. Twentyman had been named by the British Association for the Advancement of Science to represent it at this Cleveland meeting of the American Association, and that Mr. Twentyman had been invited to attend and take part in the Cleveland sessions of the council.

(5) The report of the treasurer and the financial report of the permanent secretary were accepted.

(6) The permanent secretary's notes on the financial condition of the association were accepted. (See another section of this issue of SCIENCE.)

(7) The permanent secretary presented a report on

membership up to December 19, 1930. (See another section of this issue of SCIENCE.)

(8) The permanent secretary's budget of prospective expenditures for the association year, 1930–31, was approved. The total amount is $107,510.

(9) On recommendation of the executive committee, the council elected to emeritus life membership the following named members: John Harvey Kellogg, who joined in 1875; Edward Bausch, who joined in 1877 and became a fellow in 1883; Simon H. Gage, who joined in 1879 and became a fellow in 1881.

(10) The council accepted the permanent secretary's report on fellowship nominations, secured from the section committees according to the new plan, for the calendar year 1930, and elected 1,313 fellows, distributed among the several sections as follows:

Section A, 15; Section B, 229; Section E, 232; Section F, 51; Section G, 212; Section H, 41; Section I, 56; Section K, 12; Section L, 34; Section M, 86; Section N, 105; Section O, 170; Section Q, 70.

(11) The executive committee invited the American Statistical Association to become officially affiliated with the American Association for the Advancement of Science. (This invitation has now been accepted.)

(12) The council accepted the resignations of Dr. Burton E. Livingston (permanent secretary) and Dr. Frank R. Lillie (general secretary).

(13) After considering an extended report from the executive committee and a special committee appointed by the executive committee the council unanimously elected Charles F. Roos, of Cornell University, as permanent secretary, to succeed Dr. Burton E. Livingston, at a salary of $6,000, beginning on February 1, 1931, or as soon thereafter as would be convenient to Dr. Roos.

(14) Dr. Burton E. Livingston was elected general secretary to succeed Dr. Frank R. Lillie.

(15) On recommendation of the executive committee, the council accepted with regret the resignation of Dr. R. H. True as secretary of the committee of one hundred on research, and expressed to Dr. True its very great appreciation of the valuable service he has rendered to American science through his effective work in guiding the activities of the committee of one hundred since its reorganization five years ago.

(16) On recommendation of the executive committee, the council voted that the naming of a successor to Dr. True be referred to the executive committee of the association with power.

(17) On recommendation of the executive committee, the council voted that Dr. W. A. Noyes be named a member of the executive committee of the committee of one hundred, and that the executive committee of the committee of one hundred be authorized to fill other vacancies, and to reorganize the subcommittees of the committee of one hundred wherever such action is needed.

(18) On recommendation of the executive committee the council voted that Dr. F. C. Brown and Mr. Owen Cattell be asked to continue as chairman and secretary, respectively, of the committee on research exhibits, and that they complete the committee and proceed to arrange for research exhibits at the New Orleans meeting.

(19) Acting on special authorization by the council the executive committee voted to continue the present arrangement with Colonel H. S. Kimberly, as manager of the annual exhibition, for one year, and Colonel Kimberly was asked to proceed to arrange for commercial exhibits for the New Orleans exhibition and to cooperate with Dr. Brown, Mr. Owen Cattell and the committee on research exhibits, to the end that both the commercial and research aspects of the association's exhibition at New Orleans might be as useful and satisfactory as possible. The arrangement with Colonel Kimberly is as follows: He arranges for the commercial part of the exhibition and receives all net profits up to $2,500; when profits exceed that amount they are equally divided between him and the association; each year the association advances funds to Colonel Kimberly, if necessary, up to $500, this advance to be refunded out of the income from the exhibition and charged to expense.

(20) The executive committee voted that the salary of the executive assistant, Mr. Sam Woodley, should be $4,500 per annum, beginning with January 1, 1931, and expressed its great appreciation of Mr. Woodley's loyal and efficient service to the association.

(21) The council accepted a progress report of the committee on source books in the sciences; chairman, Dr. Gregory D. Walcott.

(22) The executive committee accepted a report on *Biological Abstracts,* received from Dr. Herbert Osborn, representative of the association on the board of *Biological Abstracts.*

(23) On recommendation of the executive committee the council voted that a comprehensive survey of American colleges and universities with respect to scientific research, as recommended by the committee of one hundred, be authorized under the auspices of the committee of one hundred, with the general direction of the executive committee of the association.

(24) On recommendation of the executive committee, acting at the suggestion of the committee on grants for research, the council voted that the committee of one hundred's subcommittee on scientific publications be asked to make, with the cooperation of the committee on grants, a study of publication problems in relation to the best use of association funds, and that there be appropriated from the treasurer's available funds the sum of $500 (or such part of that sum as may be needed) for use by the subcommittee in this connection.

(25) On recommendation of the executive committee of the council, acting upon a recommendation from the committee on grants for research, the council voted that the committee on grants be asked to secure from the fellows of the association, by means of a circular letter of inquiry sent out from the Washington office, suggestions as to what particular aspects and fields of research might be specially considered by the committee on grants in its study of ways by which association funds might be used to further scientific research.

(26) On recommendation of the executive committee, the council voted to cooperate fully with Dr. Henry Crew and the other officers of the Chicago World's Fair Centennial Celebration in regard to foreign men of

science who are to be invited to give addresses at the scientific sessions to be held in connection with the World's Fair in the summer of 1933.

(27) The council voted that a committee be named by the president, in consultation with the executive committee, to represent the association in this cooperation.

(28) On recommendation of the executive committee, acting upon a special request received from Mr. Wm. John Cooper, commissioner of education, U. S. Department of the Interior, the council voted that a representative of the American Association be appointed to be a member of the professional advisory committee of the National Survey of the Education of Teachers, which has been authorized by Congress and is being carried out by the Office of Education of the Department of the Interior. The council voted that Dr. J. McK. Cattell, chairman of the executive committee and past president of the association, be named as this representative.

(29) At its Thursday session the council unanimously elected Dr. Franz Boas president of the American Association for the Advancement of Science for 1931.

(30) On nominations from the several sections the council elected fifteen vice-presidents for 1931, as follows: A, Earl R. Hedrick; B, Bergen Davis; C, Charles A. Browne; D, J. H. Moore; E, Douglas Johnson; F, R. W. Hegner; G, E. D. Merrill; H, W. K. Gregory; I, H. S. Langfeld; K, G. C. Evans; L, W. B. Munro; M, Dexter S. Kimball; N, Howard T. Karsner; O, C. G. Williams; Q, Ernest Horn.

(31) F. G. Cottrell (chemistry) and A. F. Woods (agriculture) were elected to the council (to succeed David White and L. E. Dickson), and J. McK. Cattell and Henry B. Ward were elected to the executive committee (to succeed themselves); the terms of these officers are to expire at the end of December, 1934.

(32) Herbert Gill was reelected to the finance committee, his term of office to expire at the end of December, 1934.

(33) J. McK. Cattell was nominated as a representative of the association on the board of trustees of Science Service, for a term expiring in April, 1934.

(34) On recommendation by the executive committee the council approved modifications of the rules for the prize award as follows: Presidential and vice-presidential addresses and invitation papers of the type of such addresses shall not be eligible for consideration by the award committee. The committee on award is to make its decision before leaving the meeting place, and public announcement of the award is to be made through the Association Press Service as promptly as possible, but not before the meeting has actually closed. The committee on award is to devote sufficient time to this decision, remaining a day or two after the close of the annual meeting. Each member of the award committee who thus stays over is to receive, in lieu of expenses, an allowance of $50. The subject of the prize paper for a meeting is to be specially presented at the next following summer meeting of the association if that is feasible, otherwise at the next following winter meeting.

(35) Besides the $500 noted in paragraph 24, above, the council voted the following appropriations from the treasurer's available funds: $300 for three emeritus life memberships, $3,000 for allotment by the committee on grants for research, $1,000 for expenses of the committee of one hundred on research.

(36) On recommendation of the executive committee the council voted that the meeting of December, 1932, be held at Atlantic City if suitable arrangements can be made.

(37) On recommendation of the executive committee the council voted that the summer meeting of 1932 be held at New Haven, if suitable arrangements can be made.

(38) The council voted that the executive committee and the council should hold business sessions at the summer meetings.

(39) It was voted that any section which finds it not feasible to organize a program for a summer meeting may omit its summer program.

(40) The executive committee voted that the sum of $500, or such portion thereof as might be necessary, be appropriated from the permanent secretary's funds for use in connection with arrangements for public lectures at the approaching Pasadena meeting.

(41) It was voted that the executive committee favors having a registration fee at the Pasadena meeting, also that it favors having some restriction with regard to admission to the public lectures at that meeting, so as to give some advantage to members and associates.

(42) The executive committee voted that advertising in the Pasadena program shall be arranged by the Washington office, with the cooperation of the local committee for the meeting.

(43) The executive committee voted that all associate fees collected for the Pasadena meeting and an amount equal to 25 per cent. of all life membership fees and all sustaining membership fees collected through the efforts of the Pasadena committee shall be available to the committee for financing the meeting.

(44) In response to a request from Mr. J. Franklin Meyer, it was voted by the executive committee that Dr. A. E. Kennelly and one other to be selected by him be nominated as representatives of the association in the Group of Advisers on Symbols, which is being organized by the U. S. National Committee of the International Electrotechnical Commission.

(45) It was voted that the regular spring meeting of the executive committee would be held in Washington on Sunday, April 26, 1931.

(46) Five general resolutions were each unanimously adopted by the council, as set forth in the following section of these reports.

THE FINANCIAL CONDITION OF THE ASSOCIATION

The permanent secretary presents the following notes on the finances of the association, based on the treasurer's report and the permanent secretary's financial report, which were accepted by the council at Cleveland, and on minutes of the executive committee (November 30, 1930) and of the council at Cleveland.

THE TREASURER'S FUNDS

On September 30 the treasurer's principal funds were as follows:

General endowment (income for research, etc.)		
By gifts and bequests	$103,526.66	
Fees of deceased sustaining members (3) and life members (217)	14,800.00	$118,326.66
Jane M. Smith fund (income for emeritus life memberships		5,000.00
Fees of living sustaining members (4) and life members (470) (income for any purpose)		38,900.00
Prize fund ($1,000 of principal available for prize, income for any purpose)		5,000.00
Treasurer's reserve (principal and income available for research, etc.)		9,071.31
Total		$176,297.97

The total interest received in 1929–30 was $7,416.35, the average interest rate being 4.207 per cent. Appropriations for 1930–31 and the funds from which they are derived are shown below.

	Research fund	Emeritus fund	General fund
Journal subscriptions for sustaining and life members			$1,422.00
Safe-deposit box			20.00
Expenses of grants committee, Cleveland session			126.16
Expenses of prize award committee			250.00
Three emeritus life memberships		$210.35	89.65
Allotted by committee on grants, for 1931	$3,000.00		
Expenses, committee of one hundred on research	1,000.00		
Investigation of problem of publications	500.00		
Total	$4,500.00	$210.35	$1,907.81
Amount available	4,978.00	210.35	2,228.00
Unassigned balance	$ 478.00	$	$ 320.19

Further appropriations for the current year might amount to $478.00 from research funds and $320.19 from general funds. It will be recalled that appropriations for emeritus life memberships go into the treasurer's principal funds, the income therefrom being available for any purpose until the decease of the members, after which the income becomes available only for research or similar purposes.

THE PERMANENT SECRETARY'S FUNDS

The permanent secretary's financial report of September 30, 1930, shows the following appropriable funds, some of which are, however, designated for specified purposes:

Special funds:		
Committee on Research in Colleges	$ 34.47	
Committee on Place of Science in Education	4,645.55	
Committee on Science Reading Lists	4,014.16	
		$8,694.18
Permanent secretary's emergency fund (for general purposes)		5,000.00
Publication fund (for Proceedings)		4,280.88
Meeting fund (for expenses of meetings)		3,895.00
Accumulation (for general purposes)		10,930.41
Total		$32,800.47

Appropriations from the permanent secretary's funds for this year (1930–31) will presumably be covered by the current income. It is reasonable to suppose that the total cost of operation of the permanent secretary's office for the current year may exceed the permanent secretary's proposed budget ($107,510) by as much as $3,662 without disturbing any of the funds accumulated from past years.

RESEARCH GRANTS FOR 1931

An appropriation of $3,000 from the treasurer's available funds was made by the council at Cleveland and this sum was allotted to applicants by the committee on grants for research, as follows:

Chemistry

W. H. Cole, Rutgers University, New Brunswick, N. J. For quantitative studies on chemical stimulation in animals $200

Astronomy

Margaret Harwood, Maria Mitchell Observatory, Nantucket, Mass. For continuation of studies of the size and distance of the Scutum Star Cloud through an investigation of the variable stars 300

Harlan T. Stetson, Ohio Wesleyan University, Delaware, Ohio. For research in correlation of solar radiation with ionization of the terrestrial atmosphere as determined by quantitative measurements of radio reception 400

Geology and Paleontology

Edwin T. Hodge, University of Oregon, Eugene, Oregon. For a geologic investigation directed to a comparative study of certain differences between Washington and Oregon workers 100

Biophysics

Harry Clark, Stanford University, Calif. For study of physical and biological effects of x-rays. (The particular problem for the pres-

ent is the statistical study of the lethal effect of very intense soft radiation of the organism *euplotes*) 123

Leslie A. Chambers and Newton Gaines, Texas Christian University, Fort Worth, Texas. For study of physical and biological effects of audio-frequency sound of great intensity 300

Zoology

W. W. Cort, Johns Hopkins University, Baltimore, Md. For studies on life cycles of digenetic trematodes 250

Henry Federighi, Antioch College, Yellow Springs, Ohio. For studying the reactions of the duomatophores in newly transplanted skin 50

Ann Morgan, Mount Holyoke College, South Hadley, Mass. For study on respiration and winter conditions of aquatic insects 400

Botany

W. A. Cannon, Stanford University, Calif. For continuation and extension of studies on translocation of oxygen in land plants 300

Geo. Hume Smith, 1925 Central Ave., Indianapolis, Ind. For purchase of a camera for studies on the formation and the development of the leaf buds of some of our common trees 27

Paul Weatherwax, 416 S. Dunn St., Bloomington, Ind. For studying the ancestry and relationships of the Indian corn plant 200

Physiology

Helen C. Coombs, New York Homeopathic Medical College, New York, N. Y. For continuation of studies on the nervous control of respiration 50

R. W. Gerard, University of Chicago, Chicago, Ill. For construction of apparatus for the recording of nerve action 300

OFFICERS ELECTED

The officers elected by the council at Cleveland have been named in the section on business proceedings and their names and addresses have been published in SCIENCE for January 9, 1931, pages 34 and 35. In addition to these, the section secretaries have reported the following elections, by the respective sections, of members of the corresponding section committees. Unless otherwise shown, the terms of office of all these committeemen are to expire at the end of 1934.

Section A (*Mathematics*), E. B. Stouffer, University of Kansas (to succeed R. D. Carmichael).

Section B (*Physics*), Raymond Thayer Birge, University of California (to succeed Leigh Page).

Section C (*Chemistry*), Frank C. Whitmore, Pennsylvania State College (to succeed Samuel Colville Lind).

Section D (*Astronomy*), Annie J. Cannon, Harvard Observatory (to succeed Harlan True Stetson).

Section E (*Geology and Geography*), Edward W. Berry, Johns Hopkins University (to succeed Florence Bascom).

Section F (*Zoological Sciences*), William B. Herms, University of California (to succeed Raymond C. Osburn).

Section G (*Botanical Sciences*), Henry Reist Kraybill, Purdue University (to succeed Charles O. Appleman).

Section H (*Anthropology*), Adolph H. Schultz, Johns Hopkins Medical School (to succeed William K. Gregory).

Section I (*Psychology*), Walter R. Miles, Yale University (to succeed Joseph Peterson).

Section K (*Social and Economic Sciences*), Henry Schultz, University of Chicago (to succeed himself).

Section L (*Historical and Philological Sciences*), G. M. Bolling, Ohio State University (to retire at end of 1934, succeeding Edwin W. Schreiber); L. C. Karpinski, University of Michigan (to retire at end of 1933); W. A. Oldfather, University of Illinois (to retire at end of 1932); E. Sapir, University of Chicago (to retire at end of 1931).

Section M (*Engineering*), William E. Wickenden, Case School of Applied Science (to succeed John Lyle Harrington).

Section N (*Medical Sciences*), Anton J. Carlson, University of Chicago (to succeed Joseph Leidy).

Section O (*Agriculture*), Joseph H. Gourley, Ohio Agricultural Experiment Station (to succeed H. J. Wheeler).

Section Q (*Education*), Truman Lee Kelley, Harvard University (to succeed Otis W. Caldwell).

THE PRESIDENT ELECT

(*By J. R. Swanton, Bureau of American Ethnology, Smithsonian Institution*)

Professor Franz Boas, the new president of the American Association for the Advancement of Science, was born at Minden, Germany, and attended the universities of Heidelberg, Bonn and Kiel, where he specialized in the natural sciences. He received the degree of Ph.D. from the last-mentioned institution in 1881, his first contributions to science being in the department of physics. In 1883 he was sent to Baffin Island to take charge of a German meteorological station, and there his contact with the Eskimo turned his interests definitely to anthropology. In 1885 he returned to Berlin as privatdocent in the university and assistant in the Royal Ethnographical Museum. A year later, however, he left for the North Pacific coast of our continent, destined to be the scene of much of his future work, and after a short period spent in New York on the editorial staff of SCIENCE, he returned to that field in the interests of a "Committee Appointed by the British Association for the Advancement of Science to Investigate the Northwestern Tribes of Canada," and undertook a number of field expeditions under its auspices until it closed its work in 1897. Meantime, in 1889, he was called to Clark University, then just established, as docent in anthropology, but left in 1892 to become first assistant in the anthropological department of the

World's Columbian Exposition at Chicago. This service he continued until 1894, long enough to organize the anthropological section of the Field-Columbian Museum (now the Field Museum of Natural History), an outgrowth of the great fair. In 1895 he was appointed assistant curator of anthropology in the American Museum of Natural History, New York, and from 1900 to 1905 he was full curator, during a time notable for the activities of the Jesup North Pacific Expedition, of which he was the director and the leading spirit. This expedition brought out the first specific, scientific proof of cultural relationship between peoples of Siberia other than the Eskimo and our own Indians.

In 1896 Professor Boas was appointed lecturer in anthropology in Columbia University, and in 1899 full professor, a position which he still holds. During the period of his incumbency, anthropology has experienced a very rapid growth in all its widely ramifying branches, and he has exerted a powerful influence upon the entire range of them. Aside from his own contributions to the science, he has found means and opportunity to further the work of many others, some his own pupils and some independent workers or men strategically placed to secure valuable scientific information. He took up the editorship of the *Journal of American Folk-Lore* in succession to Newell and Chamberlain, conducted it directly for many years, and is still an associate editor. He also edits, or has edited, the Columbia University Contributions to Ethnology, the Publications of the American Ethnological Society, the Handbook of American Indian Languages (Bull. 40 of the Bureau of American Ethnology), the *International Journal of American Linguistics,* the Memoirs of the Jesup North Pacific Expedition, and the bulletins of the American Museum of Natural History on anthropology during his connection with that institution. He has received honorary degrees from Clark University, from Oxford and from Graz, is an honorary or corresponding member of the principal learned societies of this country and Europe, and has presided over or occupied official positions in practically all those in America connected with his special field.

There is scarcely a branch of anthropology to which Professor Boas has not made some noteworthy contribution, and several of his papers now rank as classics. Besides his services to folklore as editor of its official organ, his name is particularly linked with a monumental publication on "Tsimshian Mythology" (in the Thirty-second Annual Report of the Bureau of American Ethnology), in which comparative studies of one relatively small group of Indians have been so extended that the work assumes the proportions of a concordance of American myths. The "Ethnology of the Kwakiutl," in the same series—which bears his name along with that of a native informant, George Hunt—exhibits a model method of extracting ethnological data through the medium of native texts. Much of the discussion of totemism and the organization of primitive society has been carried on by his pupils, but his own work on the tribes of the North Pacific coast, notably the Kwakiutl, has played a great part in it. His study of the secret societies of the Kwakiutl (in the Report of the U. S. National Museum for 1895) was the first intimation many anthropologists had of the importance of this subject. On primitive art may be mentioned "The Decorative Art of the Indians of the North Pacific Coast" (Bull. IX, American Museum of Natural History, 1897), and "Primitive Art" (Oslo and Cambridge, 1927), while his treatment of "Religion" in the Handbook of American Indians (Bull. 30, Pt. 2, Bureau of American Ethnology), is probably the best short statement of the exceedingly difficult subject of Indian belief. On specific areas, his contributions to the ethnology of the Eskimo and the Indians of the North Pacific coast are the most numerous and the most noteworthy. The larger part of these concern peoples on the northern side of the international boundary, and, as a further service to Canadian anthropology, may be mentioned his papers in the Annual Archeological Report for 1905, published as an appendix to the Report of the Minister of Education, Ontario. Professor Boas is the author of papers on Indian languages spoken in several different parts of America, including practically all those on the North Pacific coast, his most important communications being on Tsimshian, Kutenai, Kwakiutl and the Salish dialects. His latest service to the study of American Indian tongues has been exerted as chairman of a committee of the American Council of Learned Societies having to do with "Research in the Native American Indian Languages," which, thanks to a liberal grant from the Council, has already rescued a vast amount of linguistic material threatened with disintegration or in danger of total loss and furnished extensive data for detailed grammatical study and comparative use.

Professor Boas's activities in physical anthropology constitute a chapter in themselves and they have not been confined to the American aborigines. As far back as 1891 he published papers on the growth of school children and his interest in the subject has continued to the present time. But his most important work in this field, certainly that which has excited the most general interest, was initiated in 1908 when he began, under instructions from the U. S.

Immigration Commission, an investigation of the physical characters of immigrants. This indicated that certain physical characters may change in one generation in response to change in environment, a fact which of course has an important bearing upon the whole racial problem, and may make necessary a reorientation of the subject.

Loath as Professor Boas is to generalize extensively, so many studies on the bodies and minds of various peoples and racial types could hardly fail to awaken in him certain personal reactions toward cultural and human values, and it is fortunate that he has not refrained from giving expression to some of these. On the great problem of independent origination versus diffusion, which has dogged and plagued cultural anthropologists at all periods, we find him taking a carefully weighted middle ground, in vigorous opposition to extremists. Although wording his conclusions cautiously, he gives little support to upholders of any doctrine of racial superiority, and his "Mind of Primitive Man," printed in 1911 but based upon his address as retiring president of the American Folk-Lore Society in 1900, is sometimes regarded as a Magna Charta of self-respect for the "lower" races. The same spirit prevails in his "Kultur und Rasse" (1913) and in his much more recent volume, "Anthropology and Modern Life" (1928), intended for a wider audience.

The stimulus which Professor Boas has contributed to anthropology in America has borne fruit in the opening in our universities of an ever-increasing number of departments devoted to that science, staffed largely by his pupils and former associates. It is fortunate that such extensive influence is wielded by one who, besides being a tireless accumulator and precise recorder of data, is meticulously careful in weighing results and rigidly conservative in announcing conclusions.

THE CLEVELAND SESSION OF THE SECRETARIES' CONFERENCE

(Report from N. H. Heck)

The Cleveland session of the Secretaries' Conference and the secretaries' complimentary dinner were held on Thursday evening, with Harley J. Van Cleave in the chair. One of the topics discussed was the cooperation of the secretaries with the association's committee on the selection of foreign scientists who are to be invited to take part in the scientific meetings at Chicago in the summer of 1933. The problems of the sections with which societies do not hold meetings and of those with which so many hold meetings that there is congestion were given consideration. Several plans for possible improvements were suggested. Methods of securing new members of societies and of clearing the society lists formed another subject of discussion. Dr. Livingston described the working of the fellowship nomination plan adopted last year. The secretary of the Secretaries' Conference for 1931 is N. H. Heck, secretary of Section M. The chairman for 1931 is Harley J. Van Cleave, secretary of the American Microscopical Society.

THE CLEVELAND SESSION OF THE ACADEMY CONFERENCE

(Report from S. W. Bilsing)

The Academy Conference is a standing committee of the American Association, consisting of the 24 council representatives of the affiliated academies, one from each academy, and three members representing the association as a whole. It facilitates cooperation between the academies and the association as well as among the academies themselves. The Cleveland session of this conference was held on Monday afternoon, following the first Cleveland session of the association council. The conference secretary for 1930, Chancey Juday, of the Wisconsin Academy, automatically became chairman for this session and for the year 1931. S. W. Bilsing, of the Texas Academy, was elected secretary for 1931. Eighteen of the academy representatives were present, and all three representatives of the association at large, also several invited guests. Dr. E. C. L. Miller, of the Virginia Academy, presented a review of the methods and procedures followed by the several academies in developing their libraries. Dr. John T. McGill, of the Tennessee Academy, discussed science clubs in relation to the state academies, describing especially the relations that have been developed in Tennessee. Miss S. Aleta McEvoy presented, by invitation, a paper on the Illinois Junior Academy of Science, a young and very vigorous organization with branches in the high schools. It provides a means by which youthful beginners in science may develop their interests and capacities in the direction of original studies and investigations. It encourages and stimulates high-school students who have interest in science. As recently developed in Illinois, this plan has great possibilities. The conference session closed with the annual Academy dinner, given by the American Association to the members of the conference. A unanimous vote of appreciation was extended to Dr. Livingston, and through him to the American Association, for the vigorous development of the Academy Conference and for the courtesy of this Cleveland dinner.

FUTURE MEETINGS OF THE ASSOCIATION

The American Association meets annually in convocation week, at the time of the Christmas holidays, the dates of these winter meetings being determined

by the following rule. When New Year's day falls on Thursday, Friday or Saturday, the meeting period is the week (Monday to Saturday, inclusive) in which New Year's day occurs. When New Year's day falls on Sunday, the meeting period is the preceding week. And when New Year's day falls on Monday, Tuesday or Wednesday, the meeting opens on December 27 and continues through January 2.

The dates and places for several future winter meetings are shown below.

Meeting of 1931–32, New Orleans; Monday, December 28, 1931, to Saturday, January 2, 1932.

Meeting of 1932–33, probably Atlantic City; Monday, December 26, to Saturday, December 31, 1932.

Meeting of 1933–34, undecided; Wednesday, December 27, 1933, to Tuesday, January 2, 1934.

Meeting of 1934–35, probably Rochester; Thursday, December 27, 1934, to Wednesday, January 2, 1935.

The association meets regularly in a four-year rotation, at New York, Chicago and Washington. The last quadrennial meeting was held in New York, opening in December, 1928, and the meeting opening in December, 1932, would regularly occur in Chicago; but the council has voted to hold a summer meeting in Chicago in 1933, at the time of the World's Fair. The Atlantic City meeting will consequently be the quadrennial one with respect to the election of officers.

It has recently been decided to hold two meetings each year, a summer meeting in addition to the regular winter meeting. The first summer meeting on this new plan is to be held at Pasadena late in June, 1931. The exact dates are not yet surely fixed. The summer meeting of 1932 will probably be held at New Haven. As just mentioned, there is to be a summer meeting at Chicago in 1933. The summer meeting of 1934 will probably be held at San Francisco.

THE SCIENTIFIC SESSIONS AT CLEVELAND

The following accounts of the sessions of the sections and societies that met simultaneously with the American Association this year have been prepared by the permanent secretary from reports furnished by the several section and society secretaries, as indicated. They are arranged according to the association sections. Several societies are shown as related to both the zoological and botanical sections and another group is related to all sections. Reports were requested from the secretaries of all organizations shown in the General Program of the Cleveland meeting and almost all of them responded.

SECTION A (MATHEMATICS) AND RELATED ORGANIZATIONS

(Report from C. N. Moore and W. D. Cairns)

On Monday afternoon there was a joint session of Sections A and K, the American Statistical Association and the American Mathematical Society, at which time a series of interesting papers on various mathematical features of economic and statistical theory was presented by G. C. Evans, Ragnar Frisch and Harold Hotelling. On Wednesday morning Section A and Section D joined with Section L and the History of Science Society in a session in commemoration of the tercentenary of the death of Kepler. At this session papers dealing with various phases of the life and work of Kepler were presented by D. J. Struik, W. C. Rufus and E. H. Johnson. On Wednesday afternoon Section A held a joint session with the American Mathematical Society and the Mathematical Association of America. E. T. Bell gave the retiring vice-presidential address on "Mathematics and Speculation," which will be published in *The Scientific Monthly*. This paper was followed by invitation addresses by Oystein Ore and Karl Menger. Professor Ore's lecture dealt with the fundamental concepts of algebra and equation theory, and more particularly with the present point of view on the solution of equations by means of the method of Galois. Professor Menger gave an account of recent work by himself and others on constructing a theory of dimension from the axiomatical standpoint.

On Tuesday afternoon G. D. Birkhoff gave an address at the invitation of the American Mathematical Society. Professor Birkhoff's lecture was devoted primarily to an account of some of his recent work on generalizations of Poincaré's last geometric theorem and applications of these results to certain important dynamical problems. The theorem in question is the one stated by Poincaré in one of his last published papers with the remark that he had not succeeded in proving it and wished to submit it to the consideration of other mathematicians. It was proved shortly after this by Professor Birkhoff in an article which appeared in the Transactions of the American Mathematical Society in 1913. Recently Professor Birkhoff has been engaged in the study of generalizations of Poincaré's theorem to higher dimensions together with their dynamical applications, and he has been invited to present the results of these investigations in a series of lectures at the Collège de France in April of the present year. His address at Cleveland gave the mathematicians present an opportunity to acquaint themselves with the scope of these important studies.

Subsequent to Dr. Birkhoff's lecture, Professor E. B. Wilson delivered the eighth Josiah Willard Gibbs lecture on the subject, "Reminiscences of Gibbs by a Student and Colleague." As the title indicates, Professor Wilson's address dealt with the life and personality of Gibbs rather than with his technical scientific work. He painted an appealing picture of a great scientist quietly pursuing his life work without

pomp or ostentation. Among other interesting sidelights, Professor Wilson pointed out that, just as in the case of other great figures of history, many of the traditions concerning Gibbs were totally unfounded in fact.

On Tuesday morning and Wednesday morning the American Mathematical Society held six separate sectional meetings for the presentation of contributed papers. Immediately prior to the scientific sessions of Wednesday morning there was held a business session for the election of officers.

The Mathematical Association of America held two sessions on Thursday in addition to the joint meeting on Wednesday afternoon with Section A and the American Mathematical Society. Benjamin F. Finkel, of Drury College, put on record for the Mathematical Association the early history of the *American Mathematical Monthly,* which he founded at Kidder, Missouri, in 1894 and edited, largely by his own efforts, until it was assumed by a large group of American colleges and universities in 1913, and transferred formally to the Mathematical Association of America on its organization in December, 1915. J. W. Alexander, of Princeton University, presented a paper on analysis situs as a branch of elementary geometry with an indication of various problems that are as yet unsolved. J. R. Musselman, of Western Reserve University, gave a treatment of the equilateral hyperbola along lines analogous to the more familiar development of theorems connected with the circle. Tibor Radó, of Ohio State University, described the character of competition for the Eötvös prize in Hungary, a competition which calls for no mathematics beyond early collegiate courses but which requires the student to exhibit qualities that will probably lead to later creative effort. J. F. Reilly, of the University of Iowa, gave a summary of various formulas for the remainder terms used in interpolation and gave also illustrations of the accuracy of these formulas in computing logarithms. C. F. Roos, of Cornell University, gave an ordered account of the more recent mathematical formulations expressing the interrelations of demand, cost of production and profit; he showed by concrete examples what may be accomplished in fitting mathematical functions to actual commodity curves over a number of years.

SECTION B (PHYSICS) AND RELATED ORGANIZATIONS

(*Reports from A. L. Hughes and G. H. Noyes*)

Section B met with its affiliated societies, the American Physical Society and the American Meteorological Society. C. E. Mendenhall, the retiring vice-president of the section, gave an address on "Recent Developments in Photoelectricity." This was a discussion of recent experimental results and their relations to the corresponding developments in the application of the new statistics and wave-mechanics to the theory of metals. Special consideration was given to the selective effect and to some new unpublished studies of photoelectric phenomena at high temperatures, which show a systematic shift of the threshold towards the red with increasing temperature. Particular attention was paid to the photoelectric characteristics of thin films which have been investigated recently by several physicists. Though the results in this field are extremely interesting, they raise more questions than they answer. Professor Mendenhall's address was printed in full in SCIENCE for January 31. The address of the retiring vice-president was followed by a symposium on "Acoustics." The selection of acoustics as a topic was particularly appropriate in that the meeting was held in the laboratory of Professor D. C. Miller, whose leadership in acoustical research is acknowledged by all. Dr. Paul E. Sabine spoke on "Recent Developments in Architectural Acoustics." He enumerated the conditions which are requisite for "good hearing" in any auditorium, and briefly discussed the various factors involved. As the reverberation in a room is the most important single characteristic from the standpoint of architectural acoustics, the reverberation equation, which has been derived theoretically and verified experimentally, was discussed in detail. Prolonged reverberation must be avoided, but it is undesirable to avoid reverberation altogether, particularly when music is concerned. The most suitable reverberation time appears to be about 1.4 seconds. Our knowledge of architectural acoustics has now been developed to the point where it is possible to predict precisely the acoustical characteristics of a room when the materials of which it is made are known. There is therefore no longer any excuse for constructing an auditorium in which the hearing is unsatisfactory. Dr. Harvey Fletcher, of the Bell Telephone Laboratories, contributed a paper on "Some Physical Principles of Speech and Music." Oscillograph records of typical spoken English sentences showed how speech consists of a series of fundamental sounds called continuants, which are connected together by transitional elements. The continuants consist of several complete wave cycles which are almost alike, while the transitional elements consist of a continuously changing wave from cycle to cycle and sometimes of a complete stop. A series of pitch changes of these continuants constitute the main melodic stream of speech. There are two other minor melodic streams corresponding to the characteristic resonant pitches of the mouth and throat cavities when shaped for producing the various vowel sounds. Using these conceptions, the difference between speaking and singing was

pointed out. The speech power of different speakers and of different fundamental sounds spoken by a typical speaker were discussed. From peak power measurements upon typical speech, an audibility curve was constructed which showed the range in frequency and intensity of audible speech. Then followed a similar discussion of musical sounds, using oscillograms, peak and average powers of typical musical instruments, both individually and also when grouped into an orchestra. The third paper in the symposium was contributed by Dr. C. W. Hewlett, of the Research Laboratory of the General Electric Company. The title of this paper was "Concerning Some of the Problems Encountered in Recording and Producing Photographic Sound Records on Motion Picture Film." The paper began with a concise account of the train of steps between the impact of the sound waves on the microphone and their permanent registration on a moving film negative in the recording half of the process, and between the positive of this permanent record and the loud speaker in the reproducing part of the process. Appreciable distortion must be avoided at every stage in the process. The details of how distortion has been greatly diminished were fully discussed.

The attendance at the meetings of the section and its associated societies was large; it is to be recorded that 350 persons were present at the joint meeting of Section B and the American Physical Society. The regular program of the Physical Society contained about eighty-five contributed papers. At the annual meeting of the Physical Society the following officers were elected for the coming year: *President,* W. F. G. Swann; *vice-president,* P. D. Foote; *treasurer,* G. B. Pegram; *secretary,* W. L. Severinghaus.

The twelfth annual meeting of the American Meteorological Society opened on Monday morning, December 29, with President John Patterson, director of the Meteorological Office of Canada, presiding. In the two-day meeting there were three sessions and a field trip. A wide variety of papers were presented, ranging from personal experiences in taking weather observations in Greenland and Antarctica, weather with relation to air and lake navigation, education in meteorology, to meteorological history and discrepant nomenclature. The drought of 1930, which so greatly affected vast numbers of people, was a topic of keen moment. Students of meteorology not on the U. S. Weather Bureau staff provided topics for thought and lively discussion. Dr. Hobbs and Mr. Schneider conveyed the interest of the meeting to Greenland, and Mr. Harrison kept his audience in profound attention through Antarctic cold and winter darkness. Mr. Ward T. Van Orman, one of the most widely known balloonists, outlined the various steps involved in finding the optimum location for an airship transatlantic terminus on the eastern seaboard, and Mr. Patterson's presidential address revealed the minute plans in operation during the great flight of the British dirigible from England to Ontario. Mr. George A. Marr gave a highly pertinent address upon the subject of weather and Great Lakes navigation from the point of view of the public, through the agency of the shippers, shipmasters and shipowners. The shipmaster and the air pilot have to navigate their crafts through the weather and waters whereof the forecaster has advised them. A visit was made to the Cleveland Airport Weather Bureau station. Mr. C. G. Andrus described much of the detail of collecting weather reports along the airways, deducing flying conditions and getting these reports into the hands of flight operators. While the party was assembled, the flight officers of a large passenger transport plane cancelled a flight because of impending bad weather, and a few minutes later came advices that the airport to which the flight was planned had become closed in by snowstorms. Mr. V. E. Jakl, who came to this meeting by plane from Omaha, read a paper on fog and low clouds in relation to aviation, and Mr. Ralph Upson discussed the development of airplanes, showing interrelations of designer, pilot, weather and weather forecaster. Dr. Dinsmore Alter's report of his work on 203 years of English rainfall records evoked the highest interest and will inspire further research in that direction. Mr. Eric R. Miller showed occurrence frequencies of cyclonic and anticyclonic air masses as related to the somewhat indefinable term "equinoctial storm." In another paper he sketched some of the early weather work (1837–44) of Elias Loomis, of Western Reserve College, at Hudson, Ohio. In contrast to the pioneering investigation of Loomis, Mr. E. A. P. Raab gave an account of the teaching of elementary meteorology at Burgard Vocational High School, Buffalo, N. Y., one of the most modern institutions of to-day. Charts exhibited by Mr. J. B. Kincer showed the progress and intensity of the drought over the United States in 1930, and Dr. W. J. Humphreys explained general causations of droughts and their equalization in other parts of the globe. Dr. Charles F. Brooks was reelected secretary, and Mr. Willis Ray Gregg was reelected treasurer. The following were elected councilors for 1931–33: Oliver L. Fassig, S. P. Fergusson, Sampaio Ferraz, John A. Fleming and George A. Loveland.

SECTION C (CHEMISTRY)

(Report from H. P. Lankelma)

All the sessions of Section C were held jointly with the Cleveland Section of the American Chemical So-

ciety on Tuesday. A program of seventeen papers dealing with various branches of chemistry was presented. At the forenoon session Leo Friedman discussed the results of measurements of diffusion velocities in agar and gelatin and their relation to theories of gel structure. O. F. Tower described his work on the formation of Liesegang rings of manganese and nickel sulfides in gelatin and agar. R. J. Anderson presented a brief summary of four years' work on the "Chemistry of Biologically Active Lipoids from Tubercle Bacilli." Subcutaneous injection of small quantities of these lipoids into healthy animals leads to the formation of tubercular tissue. The chemical composition of the different lipoid fractions was discussed. H. S. Taylor spoke on "The Activation Energy of Adsorption and Catalytic Activity." The application of activation energy to explain different types of adsorption and to the coordination of adsorption with catalytic activity was discussed. The opening address of the afternoon session was delivered by S. C. Lind, retiring vice-president for Section C. It dealt with theories of the origin and the cracking of petroleum hydrocarbons. James F. Norris presented a paper by himself and George Thomson dealing with cracking temperatures and cracking rates of certain pentanes and pentenes. The general problem of the relation of chemical structure to cracking temperature was discussed. J. A. Nieuwland pointed out that boron fluoride forms addition products with a large number of types of organic compounds especially in the aliphatic series. The addition compounds formed with alcohols constitute a new group of organic acids. H. H. Beard discussed a series of experiments carried on by himself and V. C. Myers on "Inorganic Iron Supplements in Nutritional Anemia." Oliver Kamm, in connection with Irvine W. Grote, presented a summary of progress recently made in the purification of the two hormones from the posterior pituitary gland. At the evening session Edgar C. Britton, of the Dow Chemical Company, discussed the hydrolysis of halogenated aromatic hydrocarbons. The effect of temperature and catalytic surfaces on the nature of the products was shown and possible theories to account for their formation were presented.

SECTION D (ASTRONOMY)

(Report from Philip Fox)

The program of Section D, which held sessions on Tuesday and Wednesday, was the most extensive that has been presented without the presence of the affiliated American Astronomical Society. Attendance at the sessions averaged about fifty. D. W. Morehouse, vice-president for this section, presided. Several papers dealt with the recently discovered planet Pluto. S. B. Nicholson and N. U. Mayall find the period to be 247.7 years; distance, 39.46 A. U.; perihelion passage, 1,989; eccentricity 0.25; and mass, 1.08 times that of the earth. Walter Bartky presented new and important equations for probable error of orbital elements in terms of probable error of observations. An important paper for Section D was Roger Lowell Putnam's lecture at the general session Wednesday evening on searching out Pluto. It is interesting to note that the discovery of Pluto was truly an institutional enterprise, in which many participated. The approaching opposition was the basis of a paper presented by F. H. Seares, who pointed out differences of color coefficients and scale correction of various observers. The Leonid meteors were the subject of two papers. About 20,000 of these reach the earth annually, counting only those bright enough to attract attention. H. T. Stetson reported on a continuation of his observations on the close correlation between intensity of radio signals and the sun-spot curve; the best radio reception was in midsummer, closely following a low ebb of solar activity. There were several papers on spectroscopy. Joel Stebbins stated that the photoelectric cell is now sensitive to the equivalent of a standard candle about 3 miles away. If the candle light were as white as that of some stars it could be detected at twice this distance. At a joint session of Sections L and D and the History of Science Society the retiring vice-presidential address for Section D was presented by Harlow Shapley, on "Galactic Explorations," and Philip Fox gave a paper on the Mensing collection of historical instruments in the Adler Planetarium and Astronomical Museum. A number of members of Section D visited the establishment of the Warner and Swasey Company, where many great telescopes have been built. J. J. Nassau, the local representative for this section, received visitors at the Warner and Swasey Observatory, Case School of Applied Science. A third focus of interest was the interferometer house of Case School, where Dayton C. Miller continues observations on the ether-drift experiments.

SECTION E (GEOLOGY AND GEOGRAPHY)

(Report from Kirtley F. Mather)

Section E held three sessions on Thursday and Friday. None of the organizations related to this section were in session in Cleveland, but about seventy-five geologists attended the meeting, and twenty-seven papers were listed on the program. Edson S. Bastin, of the University of Chicago, vice-president for the section, presided at the Thursday sessions, and Charles N. Gould, state geologist of Oklahoma, was in the chair during the Friday morn-

ing session. The address of the retiring vice-president, George F. Kay, of the University of Iowa, was presented Thursday afternoon. The annual dinner was greatly enjoyed by forty geologists in the Hotel Cleveland on Thursday evening. Dr. Bastin was toastmaster and called on Dean Kay, Professor J. E. Hyde (of Western Reserve), Professor F. R. Van Horn (of Case School), Professor W. H. Hobbs (of Michigan), Professor Kirtley F. Mather (of Harvard) and Dr. Arthur Bevan (state geologist of Virginia) for remarks. Abstracts of all papers presented will be published in the March issue of the *Bulletin of the Geological Society of America,* and Dean Kay's address will appear in full in an early issue of that periodical. The thanks of all in attendance are due to Professors Hyde and Van Horn for the excellent arrangements for the meetings.

SECTION F (ZOOLOGICAL SCIENCES)

(*Reports from Geo. T. Hargitt, J. J. Davis, A. F. Burgess, Norman R. Stoll and J. M. Shaver*)

The American Society of Zoologists held sessions for the reading of papers on Tuesday, Wednesday and Thursday mornings. Exclusive of joint sessions ninety-four papers were read, distributed as follows: Comparative and general physiology, 46; cytology, 10; embryology, 14; protozoology, 4; ecology, 6; parasitology, 10; miscellaneous, 4. Several sections held sessions simultaneously, four on Tuesday and Wednesday and two on Thursday. The attendance was large, frequently running over one hundred for each section. Tuesday afternoon was devoted to informal demonstrations, about twenty papers being presented in this manner, with excellent attendance. By this method the material and illustrative aids are arranged for easy observation and the author discusses whatever phase of the work appeals to his audience; opportunity for discussion is unlimited. A joint session was held with the American Society of Parasitologists on Tuesday morning, and one with the Ecological Society of America on Wednesday morning. The meeting places and appointments were very satisfactory, and the thanks of the American Society of Zoologists and of Section F are extended to the local committee, the university and others who contributed to this success. The annual biological smoker occurred Tuesday evening, a most enjoyable social gathering, with several hundred biologists present. The museum rooms afforded an excellent place for such a gathering, and the various exhibits were open for inspection. Thanks are extended to the museum and the local biologists for their gracious hospitality on this occasion. On Wednesday evening a dinner for all zoologists was held at the Hollenden Hotel, attended by two hundred, following which was delivered the address of the vice-president for Section F, William A. Riley, of the University of Minnesota, speaking on "Some Present-day Problems in Zoological Teaching." The address of Dr. Riley will appear in full in SCIENCE.

The Entomological Society of America held its twenty-fifth annual meeting on Tuesday and Wednesday, with 44 interesting papers covering almost every phase of the vast field of entomology. C. T. Brues presented a study on the composition and origin of the insect fauna of hot springs in the Western United States. It was brought out that bacterial plants without chlorophyl were found in springs at 89° C. and blue green algae at 63.5° C., but that plants with chlorophyl were not found in springs with a temperature higher than 52° C. One species of mite, which is a typical hot springs inhabitant throughout the world, was found at 50.8° C. The temperature maximum appears to be about the same for plants with chlorophyl and for insects. C. H. Curran emphasized the importance of complete monographic papers on taxonomy, rather than scattered articles in serial publications. E. P. Felt discussed the possibility of using numerals or other symbols in entomological taxonomy. That would facilitate arrangement of collections and would make it easier to recognize the taxonomic position of any insect. An interesting and enlightening illustrated talk was given by H. B. Hungerford, on entomologists and museums which he had recently visited in Europe. Herbert Osborn gave an account of early entomological work in Ohio. One of the cicadas was reported as a new asparagus-fern pest of considerable economic importance in Florida, according to J. W. Wilson. A. A. Granovsky reviewed recent work on the relation of insects to the transmission of plant diseases. C. L. Metcalf discussed common insects that attack man, particularly the Diptera, with special reference to the time of year and time of day at which the various species appear and are annoying. I. A. Parfentjen demonstrated an apparatus to ascertain the adhesiveness of insecticide dusts. There were two useful exhibits at this meeting, one on methods of mounting Coleoptera, and one on the preparation of pyrethrum for insecticidal uses. H. J. Quayle gave the annual invitational address before an audience of over one thousand persons. His title was "Entomologists in Subtropical Countries." Officers of the Entomological Society for 1931 are: *President,* J. W. Folsom; *secretary-treasurer,* J. J. Davis.

The meeting of the American Association of Economic Entomologists was largely attended from all sections of the United States and from Canada. The

section of apiculture held its sessions on Monday, giving special attention to the effects of high temperature upon bees. In the afternoon there was a trip to the plant of the A. I. Root Company, at Medina, Ohio. The plant quarantine and inspection section met on Tuesday. The problem concerning the Mediterranean fruit fly was summarized by W. C. O'Kane. Quarantine relations of the European corn borer and the gipsy moth were presented in several papers and others dealt with the certification of apples for export to Great Britain. The general sessions of the economic entomologists were held on Wednesday and Thursday, covering a wide range of subjects. There were two papers on greenhouse insects, one on insects affecting domestic animals and a long series on insects affecting deciduous fruits. The codling moth and the removal of arsenical residues received special attention. There were eleven papers on insecticides. Pyrethrum extracts were discussed in three papers. The utilization of radioactive lead as an indicator of the solubility of acid lead arsenate was of special interest. There were four papers on forest and shade-tree insects and many on insects affecting cereal and forage crops. The European corn borer easily held first place among these. Three papers on insects affecting household and grain insects were presented. In the 19 papers on miscellaneous subjects, those on biological control were of special interest. The section of extension met on Thursday evening, holding a symposium on effects of the 1930 drought upon insect populations. The following officers were elected: *President,* J. S. Houser; *first vice-president,* W. E. Hinds; *secretary,* A. F. Burgess, Melrose Highlands, Mass.

The American Society of Parasitologists held its sixth annual meeting on Tuesday, Wednesday and Thursday. Consistently large audiences, frequently over seventy, heard a group of papers that reflected current interests in the American parasitological field. There was a large attendance at the address of the retiring president, W. W. Cort, of the Johns Hopkins University, on "Recent Investigations on the Epidemiology of Human Ascariasis." Dr. Cort summarized epidemiological researches in China and Panama, where the ascaris findings were a by-product of work on the human hookworm problem, and devoted special attention to more recent investigations in Virginia, Kentucky and Tennessee, which have emphasized an endemic public-health problem of first importance. This paper was followed by the annual tea of the society. Of especial interest were two joint sessions with the American Society of Tropical Medicine, one largely concerned with protozoological studies, while the other dealt with helminthology. The former included three papers on infections by *Endamoeba histolytica,* two papers on the morphology of trichomonad flagellates, an exceptionally well-rounded study of a leucocytozoon from the wild duck and two papers on the treatment of protozoan infections. The helminthological program included two papers on *Diphyllobothrium latum* (broad tapeworm) in North America and four on hookworm, dealing with its distribution in man in Kentucky, the slow rate of loss of worms in persons with "undisturbed" infections, and newly observed blood-sucking habits of dog hookworms. Other phases of medical interest in the nematodes were presented. The Tuesday morning session was held jointly with the American Society of Zoologists. The papers of this session, and also those given on Thursday morning, generally dealt with zoological aspects of parasitology, including problems of classification, development and ecology. There were 61 papers on the society program; 3 in entomology, 40 in helminthology and 18 in protozoology. Officers for the ensuing year are as follows: *President,* W. A. Riley; *vice-president,* A. C. Chandler; *secretary-treasurer,* N. R. Stoll, Rockefeller Institute, New York, N. Y.; *council members,* L. R. Cleveland (1 year), H. E. Ewing (2 years), W. W. Cort and E. C. Faust (4 years).

The Wilson Ornithological Club met on Monday and Tuesday with an unusually full program of 33 papers. Approximately 175 persons attended the sessions. The range of material treated in the papers was very great, covering distribution questions, territory, census methods, results of migration, physiology, ornithological exploration, morphology, history, genetics, nesting habits, food habits and other topics. Among the papers was one by Chester K. Brooks, describing, with motion pictures, the young of the Ross snow goose (*Chen rossi*) in captivity. This is the first time that the young of this goose has been raised in captivity in America. Its nesting place is still unknown and our knowledge of its young has been based on old-world investigations similar to those of Mr. Brooks. Another very significant paper was on bird temperatures by S. Charles Kendeigh. It dealt with the establishment of temperature control in the house wren. One of the high lights of the meeting was the very thorough and carefully worked-out study of survival and reproduction in a song-sparrow population during one season, by Mrs. Margaret M. Nice. She dealt to a very great extent with marked birds, and presented much information concerning their territories and the shifts involved during the spring and summer of 1930. Another special feature of the meeting was the dinner address given by Harry Oberholser, of the U. S. Biological Survey.

SECTION G (BOTANICAL SCIENCES) AND RELATED ORGANIZATIONS

(Reports from S. F. Trelease, Arthur J. Eames, A. S. Foster, F. E. Denny, A. H. Povah, H. S. Conard, W. A. Whitney and Walter Thomas)

Section G on Tuesday afternoon presented a session of invited papers reporting the results of research in several fields of botanical sciences. B. O. Dodge reported his studies on hybridization and inheritance in the Ascomycetes. Lewis Knudson discussed mycorrhiza from the point of view of physiology. Karl Sax discussed chromosome structure and explained his new theory of the mechanism of crossing over. E. N. Transeau summarized his extensive studies of the vegetation of the Ohio Valley.

The Botanical Society of America held an unusually successful meeting from Monday to Thursday, with a membership attendance of over 300. Five sections held very well-attended meetings on three days. The annual dinner for botanists was held on Wednesday evening, with an attendance of 282. President L. W. Sharp presided, and Retiring President Margaret C. Ferguson delivered the presidential address. A report on the summer meeting of the society was presented by G. B. Rigg. Announcement was made of the election of the following officers: *President,* C. J. Chamberlain; *vice-president,* E. W. Sinnott; *treasurer,* G. E. Nichols; *editor,* H. C. Cowles.

The meetings of the general section of the Botanical Society were held on Tuesday, Wednesday and Thursday mornings, with Professor J. H. Schaffner as chairman. In the field of morphology, papers treating of such topics as the ontogeny and morphology of the inflorescence of *Zea Mays,* the developmental interpretation of cataphylls in the Angiosperms and the embryogeny of certain dicotyledons were presented. Of paleobotanical interest was a paper on a lignitic fragment from New Jersey, the anatomical structure of which was interpreted as showing it to possess definite Cycadeoidean affinities. Papers of cytological interest included an analysis of chromosome behavior in certain apogamous and parthenogenetic species and the bearing of this upon the probable hybrid origin of these forms, and a detailed study of the finer structure of the chromosomes of *Tradescantia zebrina* Hort. Of genetical interest was a report on experiments that had resulted in 100 per cent. sex reversal in hemp. The field of anatomy was represented by papers on such topics as the development and histology of traumatic tissue in the giant cactus, the structure of certain Cycadofilicean roots and the development of tissues in the stem and root of *Equisetum scirpoides.* A paper which aroused considerable discussion gave an account of the bacterial population found, by means of very special technique, in anthracite coal. The important question as to whether these micro-organisms had reached their position in the coal during ancient or modern times appears to require further investigation.

Three sessions of the physiological section of the Botanical Society were held. Two papers dealt with the effect of wounding upon subsequent growth: Eloise Gerry reported the effects of fire upon subsequent growth and resin production in pine trees and H. L. Chance upon the growth response of plants subjected to severe wounding of leaves. Three papers dealt with nutrition: E. F. Hopkins presented results of experiments showing the necessity of manganese for the growth of Chlorella; D. J. Verda and others showed that absorption of sugar from a culture solution by Spirogyra was related to the nature of the inorganic salts present; L. Knudson and D. G. Clark reported on further experiments on the use of sugar in inducing germination of orchid seeds. T. Kerr made use of the micro-injection method to study the effect of various ions on streaming protoplasm in Trianea. O. F. Curtis and H. T. Chang showed that the flowering response exhibited by celery to different temperatures occurred when only the crown of the plant was exposed to the controlling temperatures. It was found by B. S. Walker that estrogenic substances (*i.e.,* those having an effect similar to that of the female hormone in animals) were present in various plant extracts, especially in extracts from actively growing parts. A. A. Dunlap gave a report on carbohydrate changes in tobacco leaves as a result of mosaic disease. J. B. Overton described the seasonal distribution of water-conducting and gas-filled portions in the woody tissue of willow and alder. F. W. Von Ohlen used microchemical methods to study the changes in soybean seeds during germination. H. J. Fuller obtained a stimulative effect upon the growth of tomato plants by the use of ultra-violet light. Unusual forms of root growth exhibited by bog plants were discussed by G. B. Rigg and E. S. Harrar. Abstracts of most of the physiological papers appeared in the December, 1930, issue of the *American Journal of Botany.* The officers elected at this meeting are: *Chairman,* G. J. Peirce; *vice-chairman,* C. G. Deuber; *secretary-treasurer,* J. M. Arthur; *members of the physiological board,* L. Knudson and E. N. Transeau.

Fifteen papers were read before the mycological section of the Botanical Society, among which may be mentioned a very interesting paper by C. Frederic Andrus on fertilization in the rusts, Cummins' work on the taxonomy of *Phragmidium,* Howard's two

papers on the physiology and cytology of the Myxomycetes and a paper by M. A. Rice on *Chrysomyxa*. A third of the papers were cytological. The most outstanding feature, however, was an invitational program celebrating the centenary of the birth of Anton de Bary, in which the American Phytopathological Society joined. For the ensuing year, Dr. Fred J. Seaver was elected chairman and Dr. Leon H. Leonian secretary.

The systematic section of the Botanical Society, under the chairmanship of C. C. Deam, state forester of Indiana, held four sessions. On Tuesday morning reports of the Fifth International Botanical Congress were given by F. D. Kern, A. J. Grout, T. G. Yuncker and E. D. Merrill. About 75 persons attended. The Wednesday morning session was devoted to a symposium on glacial relicts. About 150 persons attended. The Thursday morning session was devoted to a round-table discussion of local botanical manuals, with an attendance of about 75. The general session of this section included papers in a variety of fields and was attended by about 75. Much interest was shown in the three invitation sessions, and much more time might have been spent profitably in discussion of the very interesting papers presented. The general session was of more especial interest to systematists in the narrower sense. For the New Orleans meeting B. C. Tharp was elected chairman and W. T. Penfound, of Tulane University, secretary.

The American Phytopathological Society held its twenty-second annual meeting from Tuesday through Thursday, with the largest attendance for many years. Ninety new members were enrolled, bringing the membership to 837. The following officers were elected: *President,* Max W. Gardner; *vice-president,* L. M. Massey; *councilor,* G. W. Keitt. The *secretary-treasurer* (F. C. Meier) and *editor-in-chief of Phytopathology* (H. B. Humphrey) continue their unexpired terms. The 83 papers delivered before the society's several sessions may be grouped as follows: General and invitation papers, 4; vegetable diseases, 22; cereal diseases, 20; fruit diseases, 10; tobacco diseases, 6; diseases of miscellaneous crops, 21. Two joint sessions were held, one with Section G of the American Association and the other—designated as the Heinrich Anton de Bary (1831–1888) Centenary Memorial program—with the mycological section of the Botanical Society of America. A special session was held on extension work in plant pathology with special emphasis on methods and agencies used in reaching the people. The last part of the session on tobacco diseases was devoted to discussion of symptoms, diagnosis and control of these diseases, and several of those in attendance presented specimens, photographs and stereopticon slides. Approximately 122 pathologists and their friends assembled for their annual dinner on Tuesday evening. Retiring-president H. S. Fawcett introduced W. H. Weston, Jr., as toastmaster. A selection of songs and several "stunts" were followed by a discussion of the proposed memorial to E. J. Butler, eminent British mycologist and plant pathologist at the Imperial Bureau of Mycology, by L. R. Jones, Donald Reddick, and others. Motion pictures portraying agricultural activities in the Union of Socialistic Soviet Republics, exhibited by J. G. Dickson, concluded the program.

Full abstracts of most of the papers presented at this meeting will appear in *Phytopathology* for January, 1931. A few of the numerous points brought out, chosen at random, are mentioned below. Solid carbon dioxide ("dry ice") was held by Charles Brooks to be a possible means of controlling transit diseases of fruits and vegetables through the increase of the CO_2 content of the air as well as by the added refrigerant. H. S. Fawcett pointed out the importance of investigations on the effect of known mixtures of microorganisms in phytopathology. F. C. Stewart and H. Glasgow discussed aphids as vectors of leaf roll among sprouting potato tubers. The distribution of the latent virus in tubers of commercial potatoes was discussed by Grover Burnett and Leon K. Jones. E. S. Clark and Wm. H. Martin discussed the effect of the depth of planting and of soil moisture on the development of Rhizoctonia on the potato. A paper on seed treatment for the damping off of tomatoes was read by James J. Horsfall. Michael Shapovalov reported on the growth rate of tomatoes affected with yellows. The artificial hybridization of *Puccinia graminis tritici* and *P. graminis secalis* was announced by Margaret Newton, T. Johnson and A. M. Brown. The nuclear association of the aecium of *Puccinia graminis* was described by W. F. Hanna. The germination of wheat stem rust teliospores developed in the greenhouse was reported by Thorvaldur Johnson. The effect of mineral nutrition on the reaction of wheat varieties to leaf rust was discussed by K. D. Doak. The effect of temperature and light on the development of the uredinial stage of *Puccinia graminis* was discussed by Leonard W. Melander. The development of crown gall, hairy root and callus under controlled conditions was described by A. J. Riker, W. M. Banfield and G. W. Keitt. E. M. Hildebrand discussed the life cycle of the hairy-root organisms on the apple in relation to pathogenesis. M. W. Gardner and R. C. Baines reported on the cultural characters and host range of the apple sooty-blotch fungus. Artificial infections of apple fruits with the scab fungus were described by C. O. Bratley. W. M. Banfield described the relation of root-feeding arthropods to crown-gall infection on raspberries.

Duke V. Layton and J. J. Wilson described three new wilt-resistant watermelon varieties. The common squash bug was accused, by L. Ray Robinson and B. L. Richards, of responsibility for a new and destructive disease of cucurbits. Two species of *Septoria* were reported by L. C. Cochran as being responsible for late blight of celery. Correlative studies on the bacteriology of bean mosaic and seed transmission of the virus were discussed by Ray Nelson. The use of fertilizers in reducing the loss from the *Aphanomyces euteiches* root rot of peas was described by O. M. Haenseler. Endohydrosis of forcing cucumbers and its control were discussed by Ray Nelson. Melville T. Cook called attention to certain undescribed symptoms of mosaic in Porto Rican tobacco. Four new mosaics of tobacco were described by H. H. McKinney. The epiphytology of tobacco mosaic in North Carolina was described by Frederick A. Wolf. P. D. Peterson pointed out the influence of the three types of tobacco mosaic on the plastid pigment and chlorophyllase content of tobacco leaves. Walter N. Ezekiel, J. J. Taubenhaus and J. F. Fudge discussed nutritional studies on *Phymatotrichum omnivorum*. The development of root rot in cotton planted at different dates was described by B. F. Dana and H. E. Rea. F. L. Wellman reported on progress of the Fusarium wilt organism inside the rhizomes of banana plants. Cecil Yarwood reported on the powdery mildew of red clover. J. L. Weimer discussed alfalfa mosaic. Varietal susceptibility, distribution and control of yellow dwarf of onions was discussed by W. J. Henderson. The effect of ultra-violet radiation on representative species of Fusarium was described by Alice A. Bailey. The effect of bean extract on *Colletotrichum lindemuthianum* was described by E. S. Reynolds and B. S. Miller. C. L. Lefebvre described a fungous parasite of the European corn borer. The Dutch elm disease was reported for Ohio by Curtis May, O. N. Liming and Thelma Alexander. W. Howard Rankin described new methods for determining rate of decay behind cavity fillings in trees. Oxides of unsaturated hydrocarbons for the eradication of barberry and other pests were brought forward by R. B. Harvey. C. D. Sherbakoff described the wheat diseases of Tennessee. F. J. Greaney announced that sulphuring prevented black chaff of wheat. Sweet corn resistant to *Diplodia zeae* was described by Glenn M. Smith and John F. Trost. I. E. Melhus and Glen N. Davis reported on nodal infection with the cornsmut organism. G. W. Keitt reported on apple-scab spraying. P. A. Young discussed penetration and toxicity of petroleum-oil sprays. The presence of water-soluble arsenic in spray materials was discussed by H. C. Young. A. L. Pierstorff and H. C. Young announced results with new sulphur dusts for apple-scab control in Ohio. S. E. A. McCallan and Frank Wilcoxon described the relation of hydrogen sulphide to the fungicidal action of sulphur.

The annual dinner of the American Society of Plant Physiologists was held on Monday evening. President H. R. Kraybill presided, and 95 members were present. Charles A. Shull announced the second award of the Stephen Hales prize to Wightman W. Garner. R. B. Harvey announced that Rodney H. True had been elected to the Charles Reid Barnes life membership. In accordance with the conditions of the Stephen Hales award, D. R. Hoagland, the recipient of the 1929 award, gave an address after the dinner, entitled, "The Absorption of Mineral Elements by Plants in Relation to Soil Problems," which will be published in *Plant Physiology* for July, 1931. Thirty-nine papers were presented in the regular sessions, to an audience of from 75 to 100. There were 9 papers presented at a joint session with the American Society for Horticultural Science, to an audience of 300, and four papers were given at a joint session with Section G of the association, the Botanical Society of America and the American Phytopathological Society.

At the first session of this society, F. M. Andrews described how he had succeeded in retarding longitudinal and diametric growth by means of force applied longitudinally as well as transversely to actively growing roots of *Zea Mays* seedlings. A. H. Hendrickson and F. J. Veihmeyer reported that roots do not penetrate soils containing less moisture than the permanent-wilting percentage and that the residual moisture content at permanent wilting was governed by the nature and structure of the soil and was not influenced by evaporation conditions. Elizabeth Dean reported greenhouse studies showing that the position and extent of the root system were greatly influenced by aeration and soil type. The response to oxygen supply varied with different plant species. William A. Beck reported that the osmotic value of tissues at incipient plasmolysis, when cane sugar was employed as plasmolyzing agent, was an index of physiological activity. At the Monday afternoon session John F. Trost and others reported that both genetic and induced barrenness in Dent corn are associated with a high content of soluble nitrogen and of starch in all organs. G. H. Dungan presented results of experiments which indicated that corn tillers serve to nourish the main plant. William H. Eyster reported on the Argentia Chlorophyl pattern in maize. V. H. Morris presented comparative results from different methods of studying the moisture content of different parts of the corn plant.

At a joint session with the American Society for Horticultural Science J. W. Crist and Marie Dye reported that albino rats fed on asparagus tips as sole source of vitamin A grew in proportion to the amount of chlorophyll present. L. F. Graber described the effect of cultural practices, including defoliations, on the food reserves of agronomic plants. Ruth Addoms and G. T. Nightingale reported that calcium-deficient tomato plants absorbed little or no nitrate, even when an abundance was present in the nutrient solution. A. E. Murneek presented data on the quantitative distribution and seasonal fluctuation of nitrogen in apple trees. E. C. Auchter gave a review of the literature dealing with the propagation of fruit trees from stem and root cuttings.

At the Wednesday morning session Joseph C. Ireland and Frank M. Durbin demonstrated their use of a Burt photoelectric cell in making a continuous record of the candle-power of sunlight. S. V. Eaton reported a close correlation between weights of tops and roots and weight of nodules in soybean, all decreasing with decreasing day length and also with clipping. H. H. McKinney and W. J. Sando gave results of studies on the effects of light and temperature on wheat. Warren B. Mack and Burton E. Livingston presented experiments showing that the effect of ethylene on CO_2 production by young wheat seedlings might be either zero, positive or negative, according to the oxygen pressure in the medium. H. L. van de Sande Bakhuyzen presented evidence that root hairs, epidermis, sclerenchyma and xylem of *Vicia Faba* were electrically neutral, while cortex and phloem were negative. He pointed out that transfer of water and certain solutes through the endodermis might be governed by the distribution of electric charges. The same investigator reported experiments on the stabilizing influence of urea on isoelectric potato tissue and suggested a theory of permeability on the basis of his findings. J. D. Sayre discussed the measurement of bound water in plant tissues. Maurice Sullivan reported that the time factor was more influential than the concentration factor in producing leaf drop in potted rose bushes exposed to ethylene. Oran Raber suggested that the effect of liver extract in checking the etiolation of plants in darkness might be brought about by the same mechanism that influences hemoglobin content of human beings fed on liver extract.

At the Wednesday afternoon session Walter Thomas reported that the ratio of starch to nitrogen is, in *Pyrus Malus,* the most sensitive index of internal physiological conditions caused by differential fertilizer treatment with respect to nitrogen, phosphorus and potassium. C. H. Rogers described experiments with maize showing that little or no iron entered tissues having a pH value at or above the precipitation point of iron, whereas large quantities of iron might be found in tissues having a pH value below this point. K. D. Doak and P. R. Miller found, in eight sorghum varieties, that both phosphorus and nitrogen influenced anthocyanin production while potassium showed no effect. Geo. W. Scarth and R. D. Gibbs gave a preliminary report on the distribution and movement of water in *Populus tremula, Pinus banksiana* and *Abies balsamea* grown in Quebec.

ORGANIZATIONS RELATED TO BOTH SECTIONS F AND G

(Reports from P. C. Mangelsdorf, A. O. Weese, Geo. D. Fuller, Alfred Emerson, H. J. Van Cleave, P. W. Whiting and A. I. Ortenburger)

The American Society of Naturalists held a symposium on Thursday afternoon, on "The Future of Man in the Light of His Past." A. B. Kidder presented the views of an archeologist. He emphasized the fact that civilizations fall because of a failure to solve the social and economic problems arising from changing culture and suggested that the success of present civilization will depend on the ability of biologists and humanists to coordinate their efforts in solving these problems. William F. Ogburn spoke on the subject from the view-point of a sociologist. He predicted that the society of the future will be one of greater and greater change and complexity; that ethical conduct will become a matter of intelligence, and right and wrong a matter of social expediency rather than of law. E. M. East concluded the symposium with the views of a geneticist. He predicted a stationary population within the next five hundred years; increased racial intermixture with an accompanying increase in heterozygosity; the control of all parasitic diseases and many non-parasitic ones, and a continued thwarting of natural selection until eugenic measures become a matter of necessity. All the speakers treated the subject in a humorous vein, yet each one presented a serious and searching analysis of the problem. S. J. Holmes was elected president for 1931 and E. J. Kraus vice-president. The annual dinner was held on Thursday evening. Following the dinner an address was given by President A. F. Blakeslee.

The Ecological Society of America met on Tuesday, Wednesday and Thursday, with an attendance varying from 50 for the first morning session to 200 for the joint session with the Botanical Society of America, on Wednesday afternoon. The notable features of the meetings were the joint meetings with the Botanical Society of America and with the American Society of Zoologists and the three symposia. The first of these, in charge of President Weaver, was on "Ecology in Relation to Agriculture," the second, arranged by

H. C. Cowles, was on the "Ecological Interactions between Plants and Animals," while the third, arranged by W. E. Allen, dealt with "Environmental Units and Their Terminology." At the close of the last symposium a committee was appointed to consider the question of ecological nomenclature and to report to the next meeting of the society. The ecologists' dinner was held on the evening of Thursday, January 1, following which President J. E. Weaver gave his retiring address entitled "Who's Who on the Prairie," which was a careful consideration of the composition and relation of the grassland communities of the Middle West. The following officers were elected: *President,* A. O. Weese; *vice-president,* Francis Ramaley; *secretary-treasurer,* A. E. Emerson, University of Chicago.

The American Microscopical Society held its forty-ninth annual meeting on Wednesday. The following officers were elected for 1931: *President,* Harley J. Van Cleave; *first vice-president,* L. E. Noland; *second vice-president,* Elda R. Walker; *secretary* (3 years), James E. Ackert, Kansas State Agricultural College; *elective member of executive committee* (3 years), Horace W. Stunkard. The custodian, Henry B. Ward, reported that the Spencer-Tolles Fund is now in excess of $15,000. Drs. Ackert and Van Cleave were named to represent the society in the council of the American Association.

The Genetics Sections of the American Society of Zoologists and the Botanical Society of America met from Monday to Friday. Joint sessions with the Geneticists Interested in Agriculture, with the American Society of Agronomy and with Section O of the association were held on Monday. Problems of inbreeding were considered from various angles. Regular sessions for reading of papers were limited to forenoons. Attendance was sometimes as great as 200. Twenty-six papers were presented and fourteen were read by title. The afternoons were devoted to demonstrations. Interest centered in cytological preparations as correlated with genetic phenomena. Translocations in Drosophila and X-Y pair in man were shown by T. S. Painter (University of Texas) and the location of an interchange between two non-homologous chromosomes in maize was demonstrated cytologically by Barbara McClintock (Cornell). Stages in Drosophila spermatogenesis were shown by Bessie League (University of Texas). An outstanding feature of the meeting was a paper on "Cytological Evidence of Genetical Relationships in Oenothera," by Ralph E. Cleland (Goucher College). The most spectacular contribution was undoubtedly "Evidence of Divisibility of the Gene," presented by I. J. Agol, director of the Timiriazef Biological Institute, Moscow, U.S.S.R. Dr. Agol is spending the year in the laboratory of H. J. Muller (University of Texas). He has attained noteworthy results since his arrival in this country last fall. Officers for 1931 are as follows: *Chairman,* L. J. Stadler; *secretary-treasurer,* P. W. Whiting; *society representative,* E. W. Sinnott. The report of the committee on organization appointed at Des Moines was accepted and the officers, constituting an executive committee, were empowered to draw up a constitution and to proceed with the organization of an independent society. This society is to come into being at the next meeting (New Orleans).

The Phi Sigma Biological Research Society devoted Wednesday to the transaction of business and Thursday was devoted to the reading of papers by student members. In keeping with the policy inaugurated at the last convention, of emphasizing the scientific rather than the honorary features of this society, a program of unusual interest was presented. Over 40 papers were read by delegates from the 29 active chapters. The address at the annual dinner was given by Dr. A. S. Pearse, on "Research as a Factor in Modern Science and Life." Paul A. Warren was elected vice-president. A. I. Ortenburger, of the University of Oklahoma, was reelected secretary.

SECTION H (ANTHROPOLOGY) AND RELATED ORGANIZATIONS

(Reports from C. H. Danforth, A. Irving Hallowell and Dudley J. Morton)

The American Anthropological Association, the American Folk-Lore Society and the American Association of Physical Anthropologists all met with Section H this year on Monday, Tuesday and Wednesday. The opening session of the American Anthropological Association was given over to reports on the anthropological activities of various organizations, committees and institutions, as follows: National Research Council, F. C. Cole; Social Science Research Council, E. Sapir; Fellowships, A. M. Tozzer; State Archeological Surveys, C. Guthe; Chicago World's Fair, F. C. Cole; Institute of Human Relations, C. Wissler; Laboratory at Santa Fe, A. V. Kidder; American School of Prehistoric Studies in Europe, G. G. MacCurdy; the new Ethno-botanical Repository at the University of Michigan, M. R. Gilmore. A session was devoted almost wholly to archeological subjects, some North American, some North African and some European. Byron Cummings reported on Kiva types near Navajo Mountain. A. W. Pond described a paleolithic station and a Mousterian quartzite quarry site in the Sahara. R. W. Erich presented a report on the Second Central European Expedition of Peabody Museum (Harvard) and the University of Pennsylvania. B. F. Whorf brought forward recent

archeological and linguistic findings from Central Mexico. Another paper of linguistic interest was read by C. M. Rosenquist, on linguistic changes in the acculturation of Swedes in Texas. Folk-lore was represented by papers on Philippine folk tales, white spirituals in the rural portions of our Southern states and New-World Negro culture. Several papers dealt with ethnological questions, from various regions of the earth and there were other papers of still more general interest. Readers are reminded that copies of the general program of the Cleveland meetings may be secured free by writing to the Washington office of the association, Smithsonian Institution Building.

Officers of the Anthropological Association were elected as follows: *President,* G. G. MacCurdy; *vice-presidents,* R. Linton, C. Guthe; *secretary,* J. M. Cooper; *treasurer,* E. W. Gifford; *editor,* R. G. Lowie; *associate editors,* E. W. Gifford, F. G. Speck; *executive committee,* R. F. Benedict, F. W. Hodge, A. V. Kidder; *representative in Social Science Research Council,* E. Sapir; *representatives in National Research Council,* J. M. Cooper, T. W. Todd; *representatives in A. A. A. S. council,* E. A. Hooton, A. Hrdlička. The following officers were elected by the American Folk-Lore Society: *President,* Franz Boas; *vice-president,* Stith Thompson; *treasurer,* L. A. White; *secretary,* G. A. Reichard; *editor,* R. F. Benedict.

Following the anthropologists' dinner on Tuesday evening, A. V. Kidder gave the retiring vice-presidential address for Section H. He discussed some aspects of his investigations at Pecos, New Mexico, and called attention to a very real interest in these studies shown by visitors. He emphasized the fact that a quite naïve interest sometimes develops into useful enthusiasm for this branch of science. Aleš Hrdlička, president of the Anthropological Association, then spoke, with illustrations, on his Alaskan studies of recent years, with special reference to the problem of the original peopling of the New World. Abundant evidence is now in hand to show that successive waves of migration passed eastward along the inhospitable Arctic and west Pacific coasts of Asia, then across the short stretch of water to the slightly less forbidding coast of Alaska. Among the many papers presented before Section H, of the association, on Wednesday was one by W. W. Graves on a study of 13,000 shoulder blades, including observations on about a thousand families. Definitely hereditary types were revealed, traceable from fetal life to old age. At the same meeting, L. Foster reported on his studies of pre-Spanish and modern dolicocephalic crania from San Juan Teotihuacan, pointing out that great caution must be exercised in attempting to trace the racial influence of the Spaniards. A paper by S. D. Aberle and one by Hortense Powdermaker dealt with birds and vital statistics among the primitive peoples of New Mexico and New Ireland, respectively.

At a joint session of Section H and the American Association of Physical Anthropologists T. Wingate Todd and his collaborators presented a series of papers dealing with the significance of ossification centers and epiphyses. It was emphasized that the earliest or latest date at which a process is completed may be far more significant than anything that can be learned from the mean. Problems of age, endocrine effects and disease were discussed from this viewpoint. Important considerations were presented concerning the adolescent growth jump in anthropoid and human types. This joint session closed with a review of the phylogeny of the lower and upper jaws from fish to man, by W. K. Gregory, who gave special attention to recent findings which close more completely the ever-narrowing gaps in this series.

The American Association of Physical Anthropologists held a very successful meeting. This young organization has developed from a suggestion made two years ago, at a New York session of Section H. It held its first meeting last year, with the American Association of Anatomists. The Cleveland meeting was its second annual meeting, held in conjunction with its parent organization, Section H. The meeting was opened by President Hrdlička, who summarized the progress thus far made. The organization now has about 90 members and appears to be very vigorous. There were reports of two committees that had been named to gather information concerning human and anthropoid material available for study in the United States and Canada. A wide range of problems were presented in the scientific program, from among which may be mentioned a report by A. Hrdlička, on a study of the humerus in relation to the incidence of intercondylar fenestrations, and to a heretofore unrecorded foramen occurring above the medial epicondyle. C. V. Noback discussed the appearance of ossification centers in a young gorilla and the growth curve of the same animal in comparison with that of the human child. L. D. Redway demonstrated the use of instantaneous color photography in the study of ophthalmic cases. Another paper, by H. U. Williams, dealt mainly with the histology of seven Egyptian mummies of about 1000 B. C. W. K. Gregory told of the anatomical expedition to Africa sent out under the auspices of Columbia University and the American Museum of Natural History. His presentation was amplified by motion-picture gorilla studies presented by Professor MacGregor, official photographer of the party, and by a brief account of foot

studies of the natives given by Dudley J. Morton. T. D. Stewart discussed dental caries in ancient Peruvian skulls. The papers mentioned here are taken at random.

SECTION I (PSYCHOLOGY)

(Report from John E. Anderson)

Section I held its sessions on Friday, January 2. The main address was given by Dr. Madison Bentley, of Cornell University, retiring vice-president for Section I, on "Psychology's Family Relations among the Sciences." After describing the complex interrelations of psychology with other sciences, particularly the diversity of the tasks undertaken and the multiplicity of interests shown by psychologists, Dr. Bentley pointed out that there is more give and take between the various sciences and more evidence of integration, than formerly. He said that as psychology values more and more its independence, husbands more and more its unique resources, and clarifies more and more its proper relations among the sciences it will deal more frankly and competently with certain functions and performances of the living organism which at present fall to the lot of no distinctive member of the whole large family of sciences. Three sessions were held, at which a total of 21 submitted papers were presented. Approximately a hundred persons were present at each session. The fields represented by these papers were as follows: general, 1 paper; experimental, 4 papers; genetic or comparative, 4 papers; educational, 5 papers; social, 1 paper; and abnormal or clinical, 6 papers.

SECTION K (SOCIAL AND ECONOMIC SCIENCES)

(Reports from Charles F. Roos, Willford I. King, F. L. Roberts, Charles F. Schlatter, W. I. Myers, Hugh E. Agnew and E. W. Burgess)

On Monday afternoon Section K held a joint session with Section A (Mathematics), the American Mathematical Society and the American Statistical Association. G. C. Evans, of the Rice Institute, delivered the opening address on "Simple Types of Economic Cycles and Crises." Using a price index number introduced by the French economist Divisia, Professor Evans showed that it is possible to produce many of the characteristics of economic crises by relatively simple mathematical postulates and analysis. Henry Schultz, of the University of Chicago, led the discussion of this paper and exhibited some statistical researches on the subject. In a paper on decomposing a time series into its progressive and cyclical components, Ragnar Frisch, of the University of Oslo, *pro tempore* at Yale University, developed a promising new operational method. Oystein Ore, of Yale University, led the discussion. In the final address of the afternoon Harold Hotelling, of Stanford University, criticized Bayes' theorem and agreed with R. A. Fisher that the theory of inverse probability must be wholly rejected and that the mathematical quantity which appears to be appropriate for measuring our order of preference among different possible populations does not obey the laws of probability. He proposed to make this quantity, which Fisher calls *likelihood,* the basis of studies regarding statistical inference. W. A. Shewhart led the discussion of this paper. All other contributions by members of Section K appeared on the programs of the American Statistical Association, the American Economic Association, the American Sociological Society, the American Political Science Association, the American Farm Economic Association and other societies that met in Cleveland at the time of the association meetings.

On Monday evening a group of mathematical economists met to form a new society, to be called the Econometric Society, an International Society for the Advancement of Economic Theory in its Relation to Statistics and Mathematics. Under the guidance of Professor Joseph Schumpeter, who was elected chairman of the organization meeting, a tentative constitution, prepared by Ragnar Frisch, Irving Fisher and Charles Roos, was revised and adopted. Professor Irving Fisher, of Yale University, was elected the first president of the new society. The organization meeting was attended by Ragnar Frisch, Harold Hotelling, Karl Menger, F. C. Mills, W. F. Ogburn, Oystein Ore, J. H. Rogers, C. F. Roos, R. C. Rorty, Joseph Schumpeter, Henry Schultz, W. A. Shewhart, Carl Snyder, I. Wedervang, Norbert Wiener and E. B. Wilson.

The American Statistical Association held its annual meeting on Monday, Tuesday and Wednesday, with 23 sessions. The topics covered ranged from the statistics of finance to those of unemployment, and from the field of psychology to that of engineering. Considerable stress was laid on methodology. Most of the sessions were well attended. Professor William F. Ogburn, of the University of Chicago, was elected president for the year 1931.

The 25th anniversary meeting of the American Sociological Society, held on Monday, Tuesday and Wednesday, had the largest attendance in the history of the organization, the registration reaching nearly 600, from all regions of the United States. This meeting was significant for the number of joint sessions, especially the one for presidential addresses, with the American Economic Association and with the American Political Science Association. There was one joint session with the American Association for Labor Legislation and three with the American Statistical Society. The section on rural sociology had a joint session with the American Farm Economic

Association on the subject "A Social and Economic Program for Sub-marginal Agricultural Areas." There was also a joint session of all the social science organizations on Social Science Abstracts. The central topic of the meeting, "Social Conflict," dominated both the general sessions of this society and those meetings of its sections. The presidential address, by Professor Howard W. Odum, of the University of North Carolina, was "Regional and Folk Conflict as a Field for Sociological Study." One general session of the society was given over to aspects of race and national conflict. The section on the family held a session on "Family Adjustment and Conflicts" and another on "Youth and Race in Family Conflict." The section on the community had a session on "Conflict and Integration in Community Organization," and another, jointly with the section on rural sociology, on "Inter- and Intra-Community Conflicts." The section on rural sociology had a session on "Social Conflicts in Rural Institutions"; the section on the sociology of religion, on "The Conflict Situations Affecting Religion"; the section on psychiatry, on "Relations of Psychological Conflict and Group Conflict"; the section on educational sociology, on "The Education of Cultural and Racial Minorities in the United States." A new feature this year was a session under the auspices of the section on the teaching of sociology, devoted to experimental sociology. This section also had a stimulating meeting on the teaching of introductory courses in sociology. At the annual dinner the topic was "Sociology in the next Twenty-five Years," with speakers representing the different social sciences. On the basis of a suggestion from the Social Science Research Council, a survey was authorized for the development of a plan of research by this society, and a committee for that project was named, with Professor Howard W. Odum as chairman. The membership dues were increased to $6.00, effective for the year 1933, and the special student membership rate was raised to $4.00, effective for the year 1931. Officers elected for 1931 are as follows: *President,* Emory S. Bogardus; *Vice-presidents,* Ellsworth Faris and R. D. McKenzie; *Secretary-treasurer,* Herbert Blumer, University of Chicago.

The Metric Association held its Weights and Measures luncheon on Monday, at which A. E. Kennelly and several others spoke informally. This was followed by a session for reading of papers concerning education, publicity, legislation, engineering and industry, in relation to the universal adoption of the metric system. The annual metric dinner occurred Monday evening. This meeting was unusually successful and all present felt that much had been accomplished.

The American Association of University Instructors in Accounting held its annual meeting on Monday and Tuesday. The subjects discussed fell into three groups: problems of training, analysis of costs of distribution and accounting theory. Among the papers presented were: "A Cost Approach to Elementary Accounting," by A. C. Littleton, University of Illinois; "Mathematics in Schools of Business," by W. S. Schlauch, New York University; "The Teaching of Ethics to Accounting Students," by H. J. Peisch, president of the American Society of Certified Public Accountants, and by J. C. Meyer, St. John's College; "Accounting in France during the Period of Inflation," by M. J. Wasserman, University of Illinois; "Depreciation and Appreciation," by H. W. Sweeney, of Price, Waterhouse and Company; "Technique of Distribution Cost Accounting," by H. C. Greer, University of Chicago; "Economic Theory and Problems of Valuation," by W. A. Paton, University of Michigan. At the annual dinner Monday evening Professor J. B. Canning, of Stanford University, was presented with the award of Beta Alpha Psi, the accounting fraternity, as the author of the best book on accounting published in the year ending May, 1930. The following officers were elected for the year 1931: R. A. Stevenson, *president;* James P. Adams, Howard C. Greer and G. H. Newlove, *vice-presidents;* E. L. Kohler, *editor;* and Chas. F. Schlatter, *secretary-treasurer.*

The American Farm Economic Association held its twenty-first annual meeting on Monday, Tuesday and Wednesday, attaining a new high mark in attendance and in interest. The following officers were elected for 1931: *President,* O. C. Stine; *vice-president,* F. P. Weaver; *secretary-treasurer,* W. I. Myers, Department of Agricultural Economics and Farm Management, Cornell University. H. E. Erdman, of the University of California, continues as editor of the *Journal of Farm Economics,* with S. H. Mendum, of the U. S. Bureau of Agricultural Economics, as assistant editor.

The sixteenth annual meeting of the National Association of Teachers of Marketing and Advertising was held on Monday and Tuesday. The attendance was the largest of any like meeting that has ever been held, there being from sixty to one hundred present at the various sessions. The program was divided into five divisions, each one with a specific topic. The first of these pertained to chain stores. A representative of the organized chains appeared on the program with a large operator in the voluntary chains. It was thought that the divergence of ideas would arouse some questions of interest, but the audience was disappointed in that the speakers complimented each other highly, and each registered full agreements

with the principles and practices presented by the other. One meeting was devoted to reports from members of this association who had been working in governmental investigation of business practices. Dr. W. R. White reviewed the work of the Federal Trade Commission and explained their material that was valuable for teachers. Dr. T. N. Beckman explained the details of the forthcoming reports of the Census of Distribution. A session devoted to an analysis of marketing costs was presented in connection with the American Association of University Instructors in Accounting. One session was given over to the consideration of Industrial Marketing, a new topic for such sessions. The last session was taken up with results of various research work undertaken by different instructors in marketing. Paul G. Converse, of the University of Illinois, was chosen president for 1931, and Hugh E. Agnew, of New York University, New York City, was reelected secretary-treasurer.

SECTION L (HISTORICAL AND PHILOLOGICAL SCIENCES) AND RELATED ORGANIZATIONS

(Report from Joseph Mayer)

Section L held two joint sessions, on Tuesday with the History of Science Society, in conjunction with the Committee on the Promotion of Chinese Studies, of the American Council of Learned Societies, and again on Wednesday with the History of Science Society, Section A (Mathematics) and Section D (Astronomy). The program had been arranged by a committee of 13, made up of representatives of the four groups, of which Dr. Edward H. Hume was chairman. The linguistic phase of Section L's activities was represented in the first day's sessions, but the linguistic societies themselves met elsewhere and developed excellent programs. The opening session of Section L was devoted to Chinese science and culture, Dr. Henry Crew presiding. Mr. Arthur Hummel, chief of the Oriental Division of the Library of Congress, spoke on "The Literature of Chinese Science." A summary of a paper by Dr. David Eugene Smith, on "The History of Chinese Mathematics," an exceedingly profound treatment, was read by Dr. Vera Sanford, of Western Reserve University. These two papers provoked an excellent and lively discussion. The third paper, which was to have dealt with the alchemy of China, was read by title only, Dr. Tenney L. Davis, who was to give it, being ill. Dr. Mary Louise Foster, of Smith College, History of Science fellow of the American Council of Learned Societies, spoke briefly on the "Alchemy of Spain," and her presentation was followed by further discussion. At the second session, which continued the program devoted to Chinese science and culture, with Mr. Hummel in the chair, Dr. K. K. Chen gave an illuminating account of the history of ephedrin in the Chinese pharmacopoeia. An energetic discussion followed, on Chinese culture, medicine and science, participated in by the chairman and by Dr. William H. Welch, Dr. Arnold C. Klebs, several Chinese students and others. This session brought to the fore some of the most fundamental questions of Chinese civilization. Dr. H. W. Tyler presided at the third session, which commemorated the tercentenary of the death of Johann Kepler (1571–1630). Dr. Kirk J. Struik discussed Kepler as a mathematician; Dr. W. Carl Rufus, Kepler as an astronomer; and Dr. E. H. Johnson, Kepler as a mystic. The address of the retiring vice-president of Section D, Dr. Harlow Shapley, was delivered at the beginning of the final session. Dr. Shapley's subject was "Galactic Exploration," illustrated with slides and presenting the latest available data on the constitution of remote stellar space. Dr. William H. Welch presided. A short account of the "Historical Instruments in the Adler Planetarium and Astronomical Museum, Chicago, Illinois," was presented by Dr. Philip Fox, who illustrated the planetarium's salient features with slides and exhibited a number of excellent specimens of early craftsmanship pertaining to astronomical instruments. Dr. Louis T. More gave an excellent sketch of Sir Isaac Newton, based upon hitherto unpublished accounts of Newton's personal life and characteristics. The final paper was given by Dr. Joseph Mayer on "Plans and Outlooks for Section L." Dr. Mayer pointed out that the integration of the American Association's activities is well furthered by a view of the sciences in their historical and philological aspects. Reference was made to the forthcoming summer meeting at Pasadena, for which the incoming chairman of Section L, Dr. William D. Munro, of the California Institute of Technology, plans to organize a program, and also to the next winter meeting, to be held at New Orleans. The following are the officers of the History of Science Society for 1931: William H. Welch, *president;* Berthold Laufer and J. Playfair McMurrich, *vice-presidents;* Frederick E. Brasch, *treasurer* and *corresponding secretary;* Joseph Mayer, *recording secretary.*

SECTION M (ENGINEERING)

(Report from N. H. Heck)

For the four sessions held by Section M on December 30 and 31 the programs with the exception of the first were largely arranged by local engineers under the leadership of James H. Herron. The first session dealt with engineering education especially after leaving the university. In his address as retiring vice-president, on Engineering Culture, H. F. Moore defined culture as the training, disciplining and refining

of the moral and intellectual nature and showed that this is incomplete without the engineer's idea of tolerance and his method of applied science. Thus the engineer is the smoother of the path for the development of refinement and morals.

W. E. Wickenden, discussing the education of the engineer after leaving the university, described the results obtained in various European systems. While the major part of education is received after leaving the university, much depends on the earlier education. Better unification of education is needed.

Arthur E. Morgan spoke on engineering education as it is related to the engineer's place in society, showing that one of the engineer's most important contributions to human welfare is to demonstrate that work can be changed from menial to dignified by the manner of its performance. An engineer's ability to do this depends on his education, for which increased liberalization and unification are needed. Engineering methods should be applied to our entire social structure. Concentration of power in the hands of a few may prove dangerous unless there is assurance that those in charge are culturally suited to such responsibility.

Edwin H. Colpitts told of recent developments in telephony by which the circuits used have wider ranges of the frequencies of the human voice, with consequent reduction of underlying noises. These developments depend on modifications of design and practice, including the employment of new materials and methods. E. P. Burrell, discussing the mechanics of the telescope, showed how improvements are continually being made in optics of the telescope, in the application of electricity to give the requisite motions and in devices for precise measurement. Modern telescopes are great engines of science which make modern astronomy possible. Wilbur J. Watson described and discussed the design of the Goodyear Zeppelin Dock at Akron, Ohio. Such structures as these have become so large that it is necessary to design with special regard to reduction of wind pressure, and special investigation into this subject was necessary. The stream-line features of the Akron dock made it necessary to design special doors and machinery for operating them and special methods for erecting the whole structure had to be devised. Temperature control and the storage of helium require special attention. Zay Jeffries discussed the plasticity of metals, one of the most important concerns of industrial practice. Most of the properties considered in metal testing are related to plasticity. The use of the microscope has shown fundamental relations between plasticity and crystalline structure and study of single crystals has proved especially profitable in this connection. Many surprising discoveries have come from the study of plasticity at very low temperatures. The relations between plasticity and electric conductivity are very complex. Studies on plastic deformation in metals should be valuable to physicists as a means of unlocking the secrets of the internal structure and properties of solids. Harold L. Thomas discussed salt penetration in a tidal river. He developed mathematically a method for determining the salinity grade lines under various conditions and was thereby able to fix the approximate position of certain salinity limits affecting the growth of oysters. Joseph W. Ellms discussed problems of sewage disposal and water purification in the Great Lakes. Sewage disposal and treatment of trade wastes are essential in the maintenance of sanitary water supplies. The influence of wind and of bottom contours on the concentration of pollution in the vicinity of water intakes was considered. There is need for correlation of the two problems of pure water and sewage disposal.

George W. Field raised the point that engineers, in the very effectiveness of their methods of river control, have overlooked some very important biological considerations, connected with the importance of maintaining the cycle of matter in water. This cycle runs from inorganic material such as salts and carbon dioxide, which facilitate plankton growth, through fish and other higher forms of life, and back again to inorganic matter, from which the cycle begins once more. It was emphasized that these considerations furnish cogent reasons for holding water back in suitable reservoirs, a procedure that aids also, as is often pointed out, in flood prevention.

SECTION N (MEDICAL SCIENCES)

(Reports from C. W. M. Poynter and Benjamin Schwartz)

The societies associated with Section N chose not to meet in Cleveland this year, but the section joined with the American Society of Tropical Medicine in a program on Tuesday afternoon. The interest of this session centered around a paper by R. R. Parker, of the U. S. Public Health Service. In a study of Rocky Mountain spotted fever he reported particularly on "Variations of Virulence of the Virus as Encountered in the Wood-tick, *Dermacentor Andersoni*," and found his conclusions agreeing with those of Dr. Ricketts. Although this section presented no program at Cleveland, the medical sciences were in no sense neglected, for the American Society of Parasitology had a very strong program in affiliation with Section F and many papers in the programs of Sections H and I were of particular interest in connection with medical research.

The twenty-sixth annual meeting of the American Society of Tropical Medicine was held in conjunction

with the American Society of Parasitologists. Of the eighteen papers read, eight were on protozoology and six of these were of direct interest to students of tropical medicine. Of the ten papers dealing with helminths, five were concerned with helminths parasitic in man. Two papers dealing with the dog hookworm, *Ancylostoma caninum,* were of unusual interest to students of tropical medicine. One of the most interesting papers presented before the joint sessions was a contribution by Dr. H. S. Wells entitled: "The Blood Sucking Activities of *Ancylostoma caninum,*" presented partly by moving pictures. The following officers were elected for the ensuing year: *President,* Sidney K. Simon; *first vice-president,* Frank Smithies; *second vice-president,* E. L. Walker; *editor,* Chas. F. Craig; *councilor* for 5 years, Ernest C. Faust; *secretary-treasurer,* Benjamin Schwartz, U. S. Bureau of Animal Industry, Washington, D. C.; *assistant secretary,* Damaso de Rivas.

SECTION O (AGRICULTURE)

(Reports from P. E. Brown, H. B. Tukey, F. S. Holmes, Fred Griffee, H. C. Moore and Paul Moore)

On Monday afternoon Section O held a joint session with the Geneticists Interested in Agriculture and the American Society of Agronomy. The program consisted of a symposium on "The Application of Inbreeding and Improvement in Maize," arranged by Professor Fred Griffee, of the Maine Agricultural Experiment Station. On Tuesday morning and afternoon joint sessions were held with the American Society of Agronomy. Symposia on "Methods of Estimating Soil Deficiencies" and on "Methods of Fertilizer Application," arranged by R. M. Salter, of the Ohio Agricultural Experiment Station, were presented. The address at the annual dinner of Section O and related societies was given by M. F. Miller, of the University of Missouri, retiring vice-president for Section O, who spoke on "Erosion as a Factor in Soil Deterioration." A joint session with the Ecological Society of America was held on Thursday afternoon, the program consisting of a symposium on "Environmental Units."

The twenty-seventh annual meeting of the American Society for Horticultural Science, held on Monday, Tuesday and Wednesday, was the most successful in attendance and in quality and number of papers in the history of the organization. With 154 papers on the program it was necessary to hold eleven regular sessions, besides an evening banquet and an evening round table for extension workers. The trend in horticultural research is shown by one session devoted to stocks and propagation, one to small fruits, two to floriculture and ornamental horticulture, two to vegetable crops and five to general pomology. The principal changes are in the direction of rapid scientific development in vegetable crops, propagation, floriculture and ornamental horticulture. Interest in physiological problems continues to dominate, as indicated by a very successful joint session with the American Society of Plant Physiologists, though increase in morphological and cytological papers is also significant. The wide interests of horticultural science and the demands it makes upon allied fields in the solving of its problems is shown by papers which dealt in part with animals. Papers upon economic problems appeared for the first time, and a resolution was adopted pointing out the desirability of inviting to the next meeting papers upon economic studies in horticultural fields. The newly elected president of this society is Professor T. H. McHatton, of Georgia.

The Association of Official Seed Analysts of North America held its annual meeting on Wednesday, Thursday and Friday, with attendance larger than usual and with representatives from Canada and from every section of the United States. The secretary reported that there were fifty member laboratories in the organization. Officers elected for the coming year are: *President,* C. W. Leggatt; *vice-president,* F. H. Hillman; *secretary-treasurer,* F. S. Holmes, College Park, Md. Standing committee reports were unusually comprehensive. It was decided that this association would undertake the preparation of a handbook on seed testing to supplement the rules for seed testing adopted at Ithaca in 1926. The International Seed Testing Congress, which meets every three years, will be invited to meet in the United States in 1934. The number of papers presented at Cleveland was larger than ever before. The outstanding feature of the meeting was a symposium on "Variations among Purity Analyses and Germination Tests, and Tolerances," which occupied an entire day. The papers presented at the meeting will appear in the *Proceedings of the Association of Official Seed Analysts of North America.*

The seventeenth annual meeting of the Potato Association of America was held on Tuesday and Wednesday. Twenty-eight papers were presented, on recent experiments in potato-disease control, seed selection, spraying, tillage, etc. One half-day session was devoted to potato breeding and selection. Special impetus has been given to this phase of work in recent years by the Office of Horticultural Investigations of the U. S. Department of Agriculture and several state experiment stations. The Seed Potato Certification Committee recommended more uniformity in certification standards as applied to bin and carload inspections, and a resolution was adopted to the effect that the Potato Association is to sponsor the organi-

zation of a national seed-potato certification council, composed of certification officials representing the states conducting seed-potato certification. This council is to give special attention to the distribution of certified seed and to marketing problems.

On Monday morning the Geneticists Interested in Agriculture met with the Genetics Sections, at a symposium on "Inbreeding and Its Application to Improvement in Plants and Animals." The paper presented by F. A. Krantz showed clearly the possible value of selection in inbred lines followed by crossing as a means of varietal improvement in the potato and other similarly propagated plants. W. F. Dove presented data from studies in poultry, suggesting the value of breeding for specific characters and using matings of various degrees of relationship. On Monday afternoon there was a joint session with the American Society of Agronomy, with a symposium on the "Application of Inbreeding to Improvement in Maize." Evidence was adduced to show the value of the "pure line method" in developing disease resistance. The results from studies on convergent improvement suggest that this method offers possibilities for raising the yielding ability of F_1 crosses between selfed lines of corn. It was also shown that selfed lines varied in prepotency when used as sires on commercial varieties of maize. J. L. Lush, Iowa State College, Ames, Iowa, was elected secretary for the ensuing year.

The Crop Protection Institute held its annual dinner meeting on Monday. Professor W. C. O'Kane, chairman of the board of governors, stated that, in the ten years of the institute's life, it had administered nearly half a million dollars for various industrial organizations in research projects directed by the institute. Taken into account also must be the additional funds and labor of the stations and their men in this fine cooperative plan. Work has been conducted in more than a dozen different states and this year has extended to the Pacific coast. Projects have been carried on at Berkeley, California, and at Pullman, Washington. These were studies on the use of oils against codling moth. About a year ago this institute undertook for the Research Corporation a study of emulsions of coconut oil, which is to be continued. Paul Moore, secretary-treasurer, reported receipts of $54,025.30 in the fiscal year just closed and expenditures in the same period of $55,517.44. There was in hand $33,737.13. It was again emphasized that the Crop Protection Institute needs endowment, the income of which might be used to carry on work for which funds can not be secured from industry.

SECTION Q (EDUCATION)

(Report from W. L. Uhl)

The sessions of Section Q were on Monday, Tuesday and Wednesday. The address of the retiring vice-president for the section, Professor Frank N. Freeman, of the University of Chicago, was given on Tuesday evening at the dinner of the Section, Phi Delta Kappa and Kappa Delta Pi. Professor Freeman contrasted scientific and philosophical methods in education, and urged students of education to abandon the speculative methods of philosophers and to rely instead upon that which has been discovered and interpreted by logical procedures. There were five sessions for the reading of papers, each devoted to a single topic. Some of the papers are mentioned here. In the session on experimental study of elementary education Clifford Woody reported on an inventory test of arithmetical backgrounds for the primary grades. At the time formal education is introduced children have a considerable ability in counting and in reading numbers, in recognizing coins and knowing their value, in telling time, in recognizing and understanding simple units of measurement, and in the fundamental processes in addition and subtraction of simple combinations. The Detroit individualization experiment was reported upon by Wendell Vreeland. Six plans have been followed, with different degrees of individualization. Results from two years were given, in terms of the test scores of 13,000 pupils. The program of experimental studies of secondary education included a report upon the grade placement of mathematical concepts, by C. H. Butler. Inventory tests show that in grades seven to nine pupil's wasting of concepts often varies as much within a given grade as between different grades. Two papers, those of W. J. Grinstead and B. C. Gruenberg, showed the value of using pupils's errors in planning both regular and remedial work. S. L. Eby showed by means of word counts that modern history text-books carry a heavier vocabulary burden than the character of the facts discussed actually requires. Gordon Hendrickson discussed the relationship of interests to success in trade training. The measurement of effects of certain motion pictures in physics was treated by R. K. Watkins, whose data showed that motion pictures are neither inferior nor superior to other possible devices. Among the papers on collegiate education was a report by Frank L. Wright, from which it appears that some teacher-training institutions still depend too largely upon training students in teaching, with too little attention given to the subject-matter that is to be taught. This was corroborated by S. R. Powers, who discussed

standards for providing "respectable scholarship" for teachers of science. V. H. Noll showed that, in spite of possible fatigue and without respect to possible after-effects, college students do better work in the third hour of a continuous three-hour test than in the first hour. W. J. Osburn reported upon a continuation of his earlier investigation of overlappings in science teaching. It appears that time is ordinarily wasted in reteaching either what pupils already know or what they could recall by means of short reviews. It was estimated that one of the six semesters spent upon biology, physics and chemistry might be saved. The program of papers on social education included two reports on methodology; one of these, by Miss Ruth Arrington, treated the social implications of undirected child activity, and the other, by F. M. Thrasher, described the technique of studying the community factors that determine child behavior. F. F. Powers discussed the relation of intelligence and personality traits to false beliefs, showing that both introversion and the tendency to be influenced by false beliefs seem to result largely from early training. It was added, however, that bright pupils probably learn more erroneous statements while very young than dull pupils do. H. Meltzner, reporting upon the relation of the forgetting of unpleasant experiences to intelligence, arrived at similar conclusions. The Shields age scale for the measurement of moral judgment was discussed by E. A. Lincoln, who considered this scale to be about as satisfactory now as the Binet-Simon scale was before the American revisions of it. At the session on research in supervision S. A. Courtis presented results of an attempt to measure efficiency in terms of increase in pupil achievement. A. S. Barr dealt with the validation of tests and rating scales for the measurement of teaching ability. Papers on the organization of administration and supervision were presented by W. G. Brink, E. O. Melby and S. A. Hamrin. F. L. David reported upon a study of the personnel of recent curriculum committees in thirty-four representative school systems.

ORGANIZATIONS RELATED TO ALL SECTIONS

(Reports from Edward Ellery, Joseph Mayer, Ellen Eddy Shaw, R. W. Babcock and Julia T. Colpitts)

The executive committee of the Society of the Sigma Xi met Tuesday afternoon and transacted business as follows: informal petitions for chapter charters were considered from nine institutions; the committee on award of research grants will hereafter be appointed by the president, on nomination by the chairman of the retiring committee and the national secretary; installing officers for the installation of new chapters will be the national president and national secretary, or some substitutes appointed by the national president. The thirty-first annual convention of the society opened at 4 o'clock. Chapter charters were voted to the University of Pittsburgh and Harvard University; Rodney H. True, of the University of Pennsylvania, was elected to the executive committee, to serve five years; Frederick B. Utley, of Pittsburgh, was chosen as member of the Alumni Committee to serve five years; the executive committee was asked to consider ways in which this society might develop research talent at institutions that are without chapters; tentative plans for the semi-centennial of the society, to be held in 1936, were reported. The annual Sigma Xi dinner was held Tuesday evening, in conjunction with the American Physical Society, with an attendance of 300. This was followed by the ninth annual Sigma Xi address, under the joint auspices of the American Association and Sigma Xi, by Dr. C. E. K. Mees, on "The Science of Photography."

The seventeenth annual meeting of the American Association of University Professors was held on December 27 and 29, with an attendance of about 150 persons, representing 100 chapters. W. B. Munro presided. On the Sunday which intervened in the meeting period the members were addressed by President R. E. Vinson, of Western Reserve University, and Director A. C. Ellis, of Cleveland College. Speakers at the Saturday luncheon and the annual dinner were, respectively, President Vinson and President E. H. Wilkins, of Oberlin College, and those at the Monday luncheon were President W. E. Wickenden, of the Case School of Applied Science, and Professor W. C. Mitchell, of the Social Science Research Council. President Wickenden described the recently established working agreement between the Case School and Western Reserve University, and Professor Mitchell outlined the program of the Social Science Research Council. The constitution was amended on Monday, making it impossible for a person to be a junior member for more than five years and increasing the dues to $4.00 for active members. Officers for 1931 are: W. B. Munro, *president;* Hardin Craig and J. S. Guy, *vice-presidents;* H. W. Tyler, *general secretary,* Joseph Mayer, *executive secretary and treasurer.*

The problem of methods designed to secure academic freedom and tenure was referred to the Council and Committee A for further consideration. The following statement of principle was adopted: "No university professor who receives a fee from any person or association interested in public discussion or in testimony respecting a particular question of public importance should take part in such discussion with-

out making public the fact that he receives such compensation and making public the name of the person or association paying him the said compensation."

Upon recommendation of the council, the following resolution was adopted:

WHEREAS, during June and July, 1930, wholesale dismissals and demotions were made at the University of Mississippi, the Agricultural and Mechanical College, the State College for Women, and the State Teachers College, all of the State of Mississippi; and

WHEREAS, these dismissals and demotions were made apparently for political reasons, without the consideration of the welfare of the students affected, and, so far as we are informed, with no notice to those dismissed or demoted, as a result of which much damage has been done to the cause of education in that state as well as great injustice to those dismissed or demoted; and

WHEREAS, the American Association of University Professors believes that the welfare of the cause of education is greatly endangered by political interference of this type; therefore, be it

Resolved, that the American Association of University Professors concur in the condemnation of this action of the authorities of the State of Mississippi as expressed by the Association of State Universities, the Association of Medical Colleges, the Southern Association of Colleges and Secondary Schools, and other bodies; and further, be it

Resolved, that the above-mentioned state institutions of the State of Mississippi be and hereby are dropped from the eligible list of this Association until such time as the Administration of educational affairs in the State of Mississippi has been restored to a status acceptable to this Association.

Some of those attending the meeting of the Association of University Professors had apparently not been informed about the proper use of the railway-certificate arrangement made by the American Association for the Advancement of Science, whose registration offices endorsed thirty-five railway certificates of persons who attended the University Professors' meeting but would not register with the association. This special setting aside of the rules was authorized by the permanent secretary only because of an apparent misunderstanding, but it is not a precedent and should not be allowed to occur at future meetings. It should be clearly understood that all who use railway certificates in the name of the "American Association for the Advancement of Science and Associated Organizations" are to register with the association in order to secure endorsement (and subsequent validation) of their certificates. Because the American Association has a registration fee it is obviously unfair to make any exceptions to the rule about endorsement and validation of certificates.

The American Nature Study Society held regular sessions on Tuesday, Wednesday and Friday and met with Section Q (Education) on Wednesday morning. The meeting was opened with an address of welcome by President Bertha Chapman Cady. A paper was read on the "Activity Program—Kindergarten and Primary Grades in Elementary Science," by Ruth Palmer, of the Doan School, Cleveland, Ohio. At the joint session there were three papers of particular interest to nature study: "Humanizing Biology," by William Gould Vinal, of the School of Education, Cleveland, Ohio; "Methods in Doan School Elementary Science Curriculum Center," by Mary Melrose, general supervisor of elementary schools, Cleveland; and "The School Gardens of New York City," by Van Evrie Kilpatrick, director of nature-garden work, New York, N. Y. On Wednesday afternoon, among other speakers, V. W. Jackson gave a demonstration of motion pictures used as "stills," a very interesting use of the motion-picture reel. A. F. Satterthwait, director of the Webster Groves (Missouri) Branch of this society, spoke of activities and opportunities in branch formation, an important phase of nature-study work. Anna Clark Jones spoke, on invitation, about nature study abroad, particularly in the School for Young Naturalists, in Moscow. A. F. Satterthwait was elected president of the organization for the coming year, and Jennie E. Hall, supervisor of Nature Study in Minneapolis, was elected secretary-treasurer.

The Gamma Alpha Graduate Scientific Fraternity held its annual council meeting and convention on Tuesday and Wednesday. The principal work of the convention was the adoption of a revised constitution and by-laws, which are in keeping with the general spirit of progress within the fraternity. Approximately sixty men were present at the reunion breakfast. The officers for the following year are: *President,* Rodney W. Babcock; *secretary,* H. R. Nelson, Cornell University, Ithaca, N. Y.; *treasurer,* Carl Schmidt; *editor,* Carlton Scofield; *recorder,* D. S. Welch.

Sigma Delta Epsilon, Graduate Women's Scientific Fraternity, held its ninth annual convention following a breakfast on Wednesday morning. Forty-three members were present, with representation from every one of the eleven chapters. The national officers elected for 1931 are: *President,* Leva B. Walker; *vice-presidents,* Mrs. Dorothy Murdock and Ruth I. Walker; *secretary,* Katherine Knowlton; *treasurer,* Laura Florence. On Tuesday morning this organization arranged a breakfast to which all women in science were invited. Sixty-six members and guests were present representing about thirty institutions. Dr. Adele M. Grant gave a short history of the organization, and Dr. Mary E. Collett gave an address on "Metabolism and Circulation in Women."