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THE RICHMOND MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE AND ASSOCIATED SOCIETIES

Edited by Dr. F. R. MOULTON

PERMANENT SECRETARY

A TRIUMPH FOR THE SOUTHEASTERN STATES

As hosts for the one hundred and third meeting of the association, the first in Richmond, held from December 27 to 31, inclusive, Virginia and its cooperating neighbor states achieved a notable success. Although there were about 5,000 persons in attendance at the meeting, the misgivings respecting adequate facilities for the scientific sessions and accommodations for individuals all proved unfounded. Indeed, the rooms for the meetings were very satisfactory and won much favorable comment, and not a complaint was heard about housing.

Successful local arrangements did not simply happen. They were the result of careful planning and effective execution by a very competent general planning committee, under the chairmanship of Mr. Lloyd C. Bird, and by special committees on finance, public relations, housing, transportation, registration and information, meeting places, special dinners, entertainment of officials and distinguished guests, publication of program, entertainment, public meetings and visits to plants. These committees gave unsparingly of their time and energy and followed through on every undertaking to its final conclusion. Every one of these committees set a standard of performance that will be difficult to surpass.

The scientists of the Southeast and the South presented a total of 289 papers at the meeting as follows: Virginia, 82; North Carolina, 57; Louisiana, 39; Georgia, 25; Florida, 18; Tennessee, 14; Alabama, 13; South Carolina, 13; Kentucky, 12; West Virginia, 11; and Mississippi, 5.

Richmond lived up to the reputation of the South for hospitality. Not only were many delightful social functions arranged, but there were endless minor acts

of courtesy that made visitors feel that they were welcomed as friends. No other part of the country would have thought of supplying the visitors with apples, often offered from filled baskets by attractive young ladies. Neighboring Williamsburg and generally delightful weather offered opportunities for enjoyable excursions. On the last day of the meeting Dr. John Stewart Bryan provided a trip to Williamsburg and luncheon to members of the executive committee and to distinguished members of the association. The teas that were served at the science exhibition were greatly enjoyed by those who participated in them. Evidently the association should establish a general recreation and social center in connection with its registration headquarters and scientific exhibition, with facilities for handling incoming and outgoing mail, telephone calls and telegrams, and at which tea would be served every afternoon. There are other important benefits of a great meeting of scientists besides listening to abbreviated reports of technical investigations.

A FEW STATISTICS

In 1931 the association met at New Orleans, La., and at Nashville, Tenn., in 1927. Statistical comparisons of these most recent meetings in southern cities with the meeting at Richmond are as follows:

Meeting	*Nashville*	*New Orleans*	*Richmond*
Year	1927	1931	1938
Registration	1,662	1,447	2,553
Estimated attendance	2,500	2,750	5,000
Papers read	1,141	1,372	1,706

In addition to 34 registrations by members of the press, the registration, by states and countries, was as follows: Alabama, 20; Arizona, 1; Arkansas, 3; California, 33; Colorado, 7; Connecticut, 52; Delaware, 7; District of Columbia, 179; Florida, 21; Georgia, 37; Illinois, 91; Indiana, 34; Iowa, 28; Kansas, 12; Kentucky, 14; Louisiana, 26; Maine, 18; Maryland, 168; Massachusetts, 130; Michigan, 44; Minnesota, 33; Mississippi, 9; Missouri, 39; Montana, 4; Nebraska, 4; New Hampshire, 16; New Jersey, 80; New York, 345; North Carolina, 117; North Dakota, 2; Ohio, 96; Oklahoma, 8; Oregon, 3; Pennsylvania, 152; Rhode Island, 24; South Carolina, 20; South Dakota, 1; Tennessee, 34; Texas, 22; Utah, 1; Vermont, 7; Virginia, 460 (Richmond, 163); Washington, 1; West Virginia, 32; Wisconsin, 31; outside United States, 53 (Australia, 1; Canada, 39; Canal Zone, 1; China, 1; England, 2; Hawaii, 3; India, 1; New Zealand, 2; Puerto Rico, 3), a total of 2,553. Registration was possible only at the headquarters in connection with the Annual Science Exhibition in the Mosque. By no means all of the members of several of the affiliated societies registered as attending the meeting of the association. The British Association admits to its meetings and principal social functions only those persons who have paid its registration fee of 21 shillings.

Fifteen sections of the association and 38 affiliated and associated societies presented programs at the meeting. The scientific sessions, 219 in number, were held in 54 rooms and laboratories, 44 of which were equipped with projection lanterns that were used in the presentation of 850 papers. Five motion picture projectors were used in 22 programs, and 93 microscopes, with auxiliary lights, were provided for demonstrations by biologists. In addition to the scientific sessions, arrangements were made for 33 breakfasts, luncheons and dinners. The index of the 1,720 persons listed as authors of papers or as delivering addresses occupied 23 pages, double column, of the General Program of 269 pages.

GENERAL SESSIONS

On Tuesday evening, December 27, Dr. George D. Birkhoff, professor of mathematics in Harvard University and dean of the Faculty of Arts and Sciences, delivered his address as retiring president of the association on "Intuition, Reason and Faith in Science." This distinguished contribution to the fundamental bases on which scientific theories ultimately rest was published in the December 30 issue of SCIENCE. Dr. Wesley C. Mitchell, president of the association, presided. The large and excellent auditorium of the Mosque was largely filled with an audience which followed Dr. Birkhoff with close attention. After the address members of the association were the guests of the local committee at an enjoyable reception in the Jefferson Hotel.

On Wednesday evening, the seventeenth annual address under the joint auspices of the association and the Society of the Sigma Xi was delivered by Dr. William F. Durand, emeritus professor of Stanford University, member of the National Advisory Committee for Aeronautics and chairman of the Special Committee on Airship Design and Construction of the U. S. Navy. Dr. George W. Baitsell, professor of biology in Yale University and president of the Society of Sigma Xi, presided. The subject of Dr. Durand's address was "Modern Trends in Air Transport," under which title he delivered a clear and fascinating account of the past progress of aviation, its present trends and the fundamental limitations to which future developments are subject in respect to size of airplanes and the speed and altitude they may attain.

Following the address of Dr. Durand, Dr. David Sarnoff, chairman of the board of directors of the National Broadcasting Company, delivered a stirring address on "Science and Freedom." Large audiences enthusiastically received both addresses.

The fourth annual lecture sponsored by United Chapters of Phi Beta Kappa was delivered on Thurs-

day evening in the auditorium of the Mosque by Dr. Frank Pierrepont Graves, president of the University of the State of New York and New York State Commissioner of Education, on "Is Education a Science?" The presiding officer was Dr. J. Shelton Horsley, surgeon-in-charge of St. Elizabeth's Hospital, Richmond, Va. The lecture of Dr. Graves was especially interesting because of the activities of the Section on Education in exploring the problem of education as a science, as well as because of the rapidly increasing attention scientists are giving to problems of science education.

On Thursday evening Sir Richard Gregory, distinguished British scientist and retiring editor of *Nature*, delivered a warmly received lecture in Grace Covenant Presbyterian Church on "Religion in Science."

On Friday evening there were two general sessions. In the Auditorium of the Mosque Dr. C. Macfie Campbell, director of the Boston Psychopathic Hospital, Boston, Massachusetts, delivered the concluding address of the Symposium on Mental Health on "Human Needs and Social Resources." Dr. Campbell's address was both popular and scholarly and was a fitting conclusion to the fine program of the Section on Medical Sciences. In the Auditorium of the Jefferson Hotel, Dr. Harvey Fletcher, research director in the Bell Laboratories, retiring vice-president of the association and retiring chairman of the Section on Physics, delivered a lecture on "Auditory Patterns," which was supplemented and illustrated by demonstrations of the highest merit both from the scientific and the artistic point of view. All who attended the lecture-demonstration felt they owed much to Dr. Fletcher and his assistants for moving his expensive and highly technical apparatus to Richmond at a great cost in time and labor.

As a special event, on Tuesday afternoon, Dr. Cranston Williams delivered an address on "Dr. Charles H. Herty's Methods of Meeting the Problems of the South," and on Thursday afternoon Dr. William T. Sanger, president of the Medical College of Virginia, Richmond, delivered an address, complimentary to the ladies present in Richmond, on "Virginia Homes and Gardens." This lecture was illustrated by slides in natural color made by Mr. Max Freydeck, Medical College of Virginia.

The final special event for the general public was the exhibition by Dr. William M. Mann, director of the National Zoological Park, Washington, D. C., of motion pictures illustrating his trip to Sumatra, under the auspices of the National Geographic Society, for the purposes of obtaining specimens of wild animals.

SYMPOSIA

With the subdivisions of science into more and more special fields, integrations of the various sciences become increasingly important. Indeed, syntheses of science and explorations of the interrelations between science and society are essential for the progress of civilization. Since the association through its 15 sections and 167 affiliated and associated societies covers nearly all pure and applied science, it offers unparalleled opportunities to promote such integrations through the organization and presentation of symposia which pay little heed to the narrow boundaries of the various special subjects. For the meeting in Richmond 28 symposia were organized, ranging all the way from those presented at a single session to the one on "Mental Health," which consisted of 50 papers besides formal discussions and required three full days for its presentation. The symposia were as follows:

Section on Chemistry (C): "Reaction Rates in Organic Chemistry," 5 papers; "Natural Resins," 4 papers; and "Phenanthrene and Related Compounds," 6 papers.

Section on Geology and Geography (E), Section on Astronomy (D), American Geophysical Union and Geological Society of America: "The Importance of Geophysics to the Study of Continental Borders," 9 papers.

American Society of Zoologists and Genetics Society of America: "Chromosome Structure," 4 papers. American Society of Zoologists: "Color Changes in Animals, Their Significance and Activation," 6 papers; and "Mating Types and Their Interactions in Ciliate Infusoria; Determination, Inheritance and Relation to Sexuality," 6 papers.

American Association of Economic Entomologists, Entomological Society of America and Ecological Society of America: "Insect Populations," 5 papers.

Botanical Society of America: "The Effects of Water-Soluble Growth-Promoting Substances on Plants," 3 papers; "The Structure of Chloroplasts," 3 papers; "The Teaching of Botany." The Physiological Section of the Botanical Society of America, American Society for Horticultural Science and American Society of Plant Physiologists: "Influence of Low Temperature on Plants," 5 papers.

American Society of Plant Physiologists, American Phytopathological Society and Physiological Section of the Botanical Society of America: "The Physiology and Diseases of Cotton," 9 papers. American Society of Plant Physiologists: "The Teaching of Plant Physiology," 5 papers.

American Fern Society: "Ferns of Virginia and Neighboring States," specimens, photographs and slides.

American Society of Naturalists, American Society of Zoologists, Botanical Society of America, Genetics Society of America and the Section on Anthropology (H): "Contributions of the Higher Animals to an Understanding of Human Biology," 3 papers.

Limnological Society of America: "Some Leading Problems of Limnology with Special Reference to Lakes," 5 papers.

Section on Psychology (I): "Research in Audition: The Next Step," 5 papers.

Section on Social and Economic Sciences (K): "Significance of the Pareto Distribution," 3 papers.

Section on Historical and Philological Sciences (L), Section on Zoological Sciences (F) and Section on Botanical Sciences (G): "Centenary of the Cell Theory," 7 papers.

Section on Medical Sciences (N), American Psychiatric Association, U. S. Public Health Service, the Mental Hospital Survey Committee and the National Committee for Mental Health: "Mental Health," 50 papers. Subsection on Pharmacy of the Section on Medical Sciences (N): "Glycols," 5 papers.

Section on Agriculture (O) and Section on Social and Economic Sciences (K): "Land Use," 3 papers.

Section on Education (Q): "Economic Effects on Education," 4 papers; "Mental Hygiene and Education," 2 papers and round table; "Problems of Interpretation of Educational Research," 7 papers; "Problems of Reading," 4 papers; "New Developments in Education," 5 papers.

WALTER B. CANNON, PRESIDENT-ELECT

(By Esmond R. Long)

Dr. Walter Bradford Cannon, George Higginson professor of physiology at Harvard University, was unanimously elected president of the association at the meeting of the council on December 30. He is the first physiologist and the sixth representative from the medico-biological sciences to fill this position. His predecessors have been Minot, Welch, Flexner, McMurrich and Abel.

Dr. Cannon was born at Prairie du Chien, Wisconsin, on October 19, 1871. He received the degree of bachelor of arts from Harvard University in 1896, and graduated in medicine in 1900. Immediately thereafter he entered the department of physiology as instructor, where he displayed such ability that six years later he was appointed professor and head of the department. With brief leaves of absence his entire academic life has been at Harvard University. In 1929–30 he was exchange professor at the Sorbonne and Ecole de Médecine in Paris and in 1935 visiting professor at the Peiping Union Medical College.

For nearly forty years Dr. Cannon has been one of America's outstanding physiologists. His earliest research was in the field of gastro-enterology, centering on the motor activities of the alimentary canal; out of this came his monograph on "The Mechanical Factors of Digestion" in 1911. The interest stimulated during these inquiries led directly to the long series of investigations for which Dr. Cannon is perhaps best known, those dealing with hunger, pain, strong emotional states and the associated physiological mechanisms. He published his well-known work on "Bodily Changes in Pain, Hunger, Fear and Rage," one of the classics of modern physiology, in 1915, characteristically dedicating it to the ten associates with whom he had conducted the fundamental investigations. His central theme was the release of energy in times of need and stress through mechanisms involving the adrenal glands, the sympathetic nervous system and the regulatory apparatus for the metabolism of sugar. The concepts involved, bridging physiology and psychology, were unique, and in the early years strongly contested by some physiologists. Cannon met all opposition with temperance and continued industry in the laboratory, and in the succeeding years steadily overcame the objections raised. The second edition appeared in 1929, with his major principles accepted.

A third book, almost as well known, was "Traumatic Shock," published in 1923 and based in large part on Cannon's observations in 1917–18 as a medical officer with the American and British Expeditionary Forces. Other works, some purely technical and others semi-popular, were "A Laboratory Course in Physiology" (1910), "The Wisdom of the Body" (1923), "Digestion and Health" (1936) and "Autonomic Neuro-effector Systems" (with Rosenblueth, 1937).

As an educator he has been eminent. From his first years after graduation he has promoted effective medical education. His distinction as a scientist has been widely recognized and marked by many honors. He was Croonian lecturer of the Royal Society in London in 1918, Linacre lecturer at Cambridge University in 1930, Herter lecturer in New York in 1932 and Kober lecturer for the Association of American Physicians in 1934—to mention but a few. He has received honorary doctorates from Yale University, Wittenberg College, Boston University and the Universities of Liège, Strasbourg and Paris, as well as from his alma mater, Harvard University.

Dr. Cannon is to-day no less active in the laboratory than at the beginning of his scientific career. In the intervening years, however, he has given continual service to the scientific organizations with which he has been connected, which have in turn elected him to positions of responsibility. Among other offices he was president of the American Physiological Society in 1914 and a fellow since 1906 of the American Association for the Advancement of Science. He has been a member of the National Academy of Sciences and National Research Council for many years, and of the important policy committee of the latter organization, as well as chairman of one of the council's most effective committees.

During the years of this activity he has made the advancement of knowledge through unfettered research

a primary interest. At a time of world conflict in state systems, involving fundamental disagreement over the right of politically constituted authority to control education and investigation, Dr. Cannon's election brings to the presidency of the association not only a wise administrator, but a champion of intellectual liberty and the freedom of research.

THE ASSOCIATION PRIZE AWARD

Each year the association awards a prize of $1,000, provided by an anonymous friend, for an outstanding contribution to science presented at its annual meeting. The committee on award, consisting of Howard A. Meyerhoff, *chairman* (geologist), Dr. F. C. Bishopp (zoologist), Dr. E. A. Culler (psychologist), Dr. Farrington Daniels (chemist) and Dr. William J. Robbins (botanist), unanimously recommended the awarding of the prize for this year to Dr. Norman R. F. Maier, assistant professor of psychology in the University of Michigan, for his paper, illustrated by motion pictures, on "Experimentally Produced Neurotic Behavior in the Rat," which was presented before the Section on Psychology on Tuesday morning, December 27.

In presenting the award to Dr. Maier, the committee fulfilled the hope of the anonymous donor of the prize that it might be bestowed upon one of the younger scientists, not only as a reward but as a stimulus for further work, because Dr. Maier is only 38 years of age. He was born in a village in Michigan, Sebewaing, on November 27, 1900. He took his A.B. degree in the University of Michigan in 1923, majoring in the physical sciences. After teaching in a high school for a year, he returned to the university and took the M.A. degree in 1925, majoring in philosophy and psychology. He then spent a year in the University of Berlin, which at that time, as the center of the Gestalt Movement, was attracting the attention of psychologists in all parts of the world. He returned to Ann Arbor and took his doctor's degree in 1928. He then received a National Research Council Fellowship during 1929 and 1930 for study with Professor K. S. Lashley at the University of Chicago, after which he became a member of the staff of the department of psychology of the University of Michigan.

Dr. Maier's investigations were in the general field of nervous disorders that are not accompanied by any discoverable physical cause. In human beings these mental diseases are among the most baffling and serious. In referring to Dr. Maier's experiments, the committee on award stated: "He has produced in rats behavior, the neurotic character of which seems to the committee, and to the critical audience which heard his paper, to be beyond doubt. This behavior was produced under conditions so controlled that cause and effect can be scientifically analyzed. The committee does not feel that the author's analysis of the phenomena is complete, nor does it believe that the small number of rats in which neurotic behavior was experimentally induced is sufficient for generalization or sweeping conclusions, and it gives credit to Dr. Maier for the conservatism he exhibited and for the scrupulous avoidance of applying his discoveries prematurely to the field in which they ultimately will be vastly significant—namely, neurotic behavior in human beings."

SOME RESOLUTIONS BY THE COUNCIL

On December 27, the council unanimously passed the following resolution on the life, work and death of Dr. Earl B. McKinley:

In the death of Earl Baldwin McKinley science in America suffered an irreparable loss. When on July 29 the Hawaii Clipper disappeared in the China Sea, it brought to a tragic and untimely end the life of this able and devoted worker, who had rendered signal services in his own country and in distant lands to the advancement of science and to the conquest of disease.

Trained in arts and medicine at the University of Michigan by distinguished teachers and investigators, McKinley was drafted into the faculty of the university even before he had received the medical degree. Rapidly new opportunities offered themselves to him. Research in the tropics of Orient and Occident made him familiar at first hand with the great plagues of man. A keen observer and able interpreter, he promptly won recognition and support for his research projects. With breadth of vision granted only to the few, he sensed intuitively the significant lines of attack on great problems in bacteriology, tropical medicine and public health.

While he gave distinguished services to several universities in this country, he spent a large part of a short but eventful life in the tropics; and only a year ago returned from a sabbatical year devoted to experimental work on leprosy. His last great venture sought to determine the influence of upper air currents in the transportation and dispersal of disease germs. Suddenly with the epoch-making flight westward nearly completed, and in company with another distinguished scientist and member of the American Association for the Advancement of Science, Fred C. Meier, some unknown disaster closed the record. In sight of success he went down to glorious defeat in the great struggle of the human race for freedom from the bondage of disease.

A loyal friend, a genial and vigorous fighter for high ideals, never turned from his purpose by narrow criticism, animated by the constant desire to make the world he knew a better place to live in, McKinley left his mark on many undertakings in science, education and social advancement. The Executive Committee of the American Association for the Advancement of Science, to the work of which he had unselfishly and generously devoted much time and energy, wishes through this tribute to bear testimony to his services for the cause of science and for the welfare of man. All his fellow workers wish to join also in expressing to his family heartfelt sympathy and condolence.

On December 29, the council unanimously adopted the following minute:

The American Association for the Advancement of Science at its annual meeting in Richmond places on record its appreciation of the cooperation of the Smithsonian Institution and of its distinguished secretaries, the late Charles D. Walcott and the present secretary, Dr. C. G. Abbot. The Smithsonian Institution has since 1907 provided rooms in its building for the headquarters of the association, free of all charge for rent or incidental expenses, and in December, 1928, increased the space to meet the growing needs of the association.

The association may look forward to a building of its own which might provide headquarters also for the national scientific societies affiliated with it; but this will require large funds. In the meanwhile the association is most fortunate in its present location and address. The Smithsonian Institution is a national and international foundation, unique in its origin, its control and its history. On its seal its objects are stated in the classic words: "For the increase and diffusion of knowledge among men." The objects of the American Association for the Advancement of Science are the same; these great organizations can to advantage work together for their attainment.

On December 30, the council unanimously passed the following resolution:

RESOLVED: That the council, having accepted on October 22, 1938, the offer of J. McKeen Cattell and Josephine Owen Cattell to sell and transfer to the American Association for the Advancement of Science the journals SCIENCE and *The Scientific Monthly*, and having directed the executive committee to complete the details of the purchase and transfer, hereby approves and ratifies the action of the president and permanent secretary in executing on December 12, 1938, by direction of the executive committee, the contract on behalf of the American Association for the Advancement of Science.

The council again expresses to Dr. Cattell and Mrs. Cattell its appreciation of the work they have carried on for many years in editing and publishing the journals, and for transferring them to the American Association for the Advancement of Science under most generous terms.

On Friday, December 30, the council unanimously passed a resolution of appreciation to the citizens of Virginia which, in part, is as follows:

RESOLVED: That the American Association for the Advancement of Science and its affiliated societies express their deep appreciation to the citizens of Virginia for their splendid cooperation in connection with the 103rd meeting of the association, and the first Virginia meeting, which was held in Richmond from December 27 to 31, 1938. At this meeting about 220 scientific sessions were held, before which about 1,700 papers were presented. In addition to 15 sections of the association, there were 38 associated societies, the total attendance being about 5,000.

PRESS SERVICE

Although the science writers representing the daily press for more than a decade have sent out excellent reports of the meetings of the association, their work at Richmond reached a new high level. This happy result was due in part to the fact that the authors of the scientific papers sent in copies or abstracts of 590 of them out of a total of 1,706 on the programs. The previous high mark, reached last year, was a total of 377 advance contributions out of a total of 1,681 papers on the programs. This year 112 papers and abstracts were mimeographed and distributed to representatives of the press, some of them as much as 10 days before the meeting. Last year 67 papers and abstracts were mimeographed.

Another important reason for the successful publicity of the meeting was the press service organized by the local committee on public relations, under the chairmanship of Dr. Sidney S. Negus. For weeks a stream of excellent publicity went out from this committee, and the facilities provided for representatives of the press during the meeting were unexcelled. More than half a million words were sent out by mail and wire by representatives of the Associated Press, the United Press, the International News Service and Science Service and the 21 daily papers which had special correspondents in Richmond to report the meeting. Columns appeared daily in newspapers from coast to coast, often on the first pages of leading papers. The meeting was the "big news" of the week, as Mr. Thomas R. Henry, president of the National Association of Science Writers, expressed it. Not only was the country informed about the progress of science by the press, but the scientists themselves, even those who attended the meeting, learned much about science and their own activities from the daily papers. In commenting on the accounts of the meeting sent out by the science writers, Sir Richard Gregory said that nothing comparable to them in quantity or in quality was known in Great Britain.

RADIO PROGRAMS

During the meeting at Richmond a total of 34 broadcasts were delivered by the scientists, several of them over national networks. The largest number of broadcasts at any previous meeting of the association was 16 at Indianapolis last year. The success in arranging broadcasts at Richmond was largely due to Professor George W. Jeffers, who carried the entire responsibility of arranging programs and of getting those who were to deliver broadcasts at the right broadcasting stations at the scheduled times.

The bright spot in the radio program was the broadcast of Sir Richard Gregory over the blue network of the National Broadcasting Company on "Religion in

Science." Other speakers were: Dr. Leroy Allen, Dr. E. R. Becker, Mr. Rudiger Bilden, Dr. A. F. Blakeslee, Dr. Eliz. Deichmann, Dr. C. L. Fenton, Mr. A. R. Gopal-ayengar, Dr. Lawrence Irving, Dr. G. W. Jeffers, Mr. A. S. Klemetsmo, Dr. C. C. Little, Dr. William M. Mann, Professor A. B. Massey, Dr. Medsger, Dr. H. A. Meyerhoff, Dr. W. R. Miles, Dr. F. R. Moulton, Mr. F. P. Mulgannon, Mr. Wilbur Nelson, Dr. E. Lawrence Palmer, Dr. G. M. Parker, Mr. C. W. Quaintance, Miss E. E. Shaw, Dr. C. C. Speidel.

THE ANNUAL SCIENCE EXHIBITION

There were 47 exhibits in the Annual Science Exhibition, which was organized by Mr. Owen Cattell. Of these exhibits, 4 were by individual scientists in their special fields, 13 by scientific institutions and organizations, 10 by publishers of scientific books and 17 by manufacturers of scientific materials and equipments. The space in the Mosque occupied by the exhibition and the registration desks of the association was in every way satisfactory. A room adjacent to the exhibition in which scientific motion pictures were almost continually exhibited was an added attraction. Since much of scientific importance can be clearly presented by motion pictures that can not be readily described by words, it is obvious that this means of instructing and entertaining the public should be steadily expanded. The science exhibition must become an increasingly important feature of the meetings of the association.

The scientists who put on exhibits of their processes and products were: Dr. Albert F. Blakeslee, Carnegie Institution of Washington; Dr. Charles T. Knipp, University of Illinois; Dr. Samuel A. Mitchell and the University of Virginia; and Dr. Louis B. Wilson, the Mayo Foundation. The scientific institutions and organizations which presented exhibits were: *Biological Abstracts;* Boyce Thompson Institute for Plant Research; U. S. Bureau of Animal Industry; Carnegie Institution of Washington, Cold Spring Harbor; Carnegie Institution of Washington, Department of Terrestrial Magnetism; Duke University in cooperation with the Virginia Agricultural Experiment Station; U. S. Forest Service; Institutum Divi Thomae, Cincinnati; Museum of Science and Industry, New York; National Bureau of Standards; U. S. Soil Conservation Service; American Association for the Advancement of Science. The publishers having exhibits were: Blakiston's Sons and Company; The Macmillan Company; McGraw-Hill Book Company; the C. V. Mosby Company; Prentice-Hall, Incorporated; W. B. Saunders Company; The Science Press; University Presses; John Wiley and Sons, Incorporated; and The Williams and Wilkins Company. The commercial exhibitors were: American Instrument Company; American Tobacco Company; Bakelite Corporation; Bausch and Lomb Optical Company; Clay-Adams Company; Distillation Products, Incorporated; Eastman Kodak Company; Ford Motor Company; The General Biological Supply House, Incorporated; Gradwohl School of Laboratory Technique, St. Louis; Leeds and Northrup Company; E. Leitz, Incorporated; The Linguaphone Institute; Merck and Company; Phipps and Bird, Incorporated; Radio Corporation of America; Spencer Lens Company; and Superior Tube Company.

THE SECRETARIES' CONFERENCE

(From report by Ernest Carroll Faust)

At the annual Secretaries' Conference, held on December 30 under the chairmanship of Dr. Otis W. Caldwell, a memorandum on cooperation between different sections of the association by Dr. Neil E. Gordon, secretary of the Section on Chemistry, was presented and discussed. The note struck in Dr. Gordon's memorandum became one of the principal topics of interest in the general discussion which followed on the problem of organizing programs for the sections and the associated societies.

In the call for the conference sent out by Dr. Faust, it was suggested that the secretaries might discuss (a) their policies in choosing papers, (b) the method of organizing joint sessions and symposia, and (c) demonstration meetings. A spirited and highly beneficial discussion of these and related topics was participated in by Drs. E. P. Hutchinson (Social and Economic Sciences), M. F. Morgan (Agriculture), Percival M. Symonds (Education), J. T. Buchholz (Botany), Malcolm H. Soule (Medical Sciences), Wilton M. Krogman (Anthropology), George F. Baitsell (Zoology), J. McKeen Cattell (Executive Committee), Esmond R. Long (Executive Committee), J. S. Karling (Torrey Botanical Club), E. W. Lindstrom (Genetics Society of America), C. W. Quaintance (American Nature Study Society), Charles F. Brooks (American Meteorological Society), and Oliver R. McCoy (American Society of Parasitologists). After the close of the discussions the 28 persons present attended a complimentary dinner given by the association to the secretaries.

SCIENTIFIC SESSIONS

SECTION ON MATHEMATICS (A) AND ASSOCIATED SOCIETIES

(From report by E. R. Hedrick)

Of special interest to members of Section A was the retiring presidential address on Tuesday evening by Dr. George D. Birkhoff, the retiring president of the association. His discussion of the subject, "Intuition, Reason and Faith in Science," was based upon the classical work done in mathematics, on the logical

structure of this field, chiefly during the present century. He showed how the same ideals can be applied to all branches of science. Since it has been fifteen years since a mathematician has occupied the presidency of the association and since Dr. Birkhoff is an outstanding leader in mathematical work, this address, though technically not a session of Section A, deserves particular emphasis in any report of the mathematical work presented at Richmond.

It is equally significant that other sessions of Section A were held in conjunction with Section E (Geology and Geography) and with Section L (Historical and Philological Sciences). Recent efforts toward cooperation with other sciences and toward emphasis upon relations of mathematics with other fields are exemplified by these sessions.

On Wednesday morning, W. D. Cairns addressed Section A as its retiring chairman and retiring vice-president of the association, on the topic, "Seismology from a Mathematical Point of View." Participating in this session were not only the American Mathematical Society and the Mathematical Association of America, but also Section E (Geology and Geography). J. R. Kline, the chairman of Section A, presided. The audience was deeply impressed by the scholarly presentation of the applications of mathematics to a field not commonly conceived as one to which mathematics contributes vitally.

Also, on Wednesday morning a far different audience, again comprising many persons from other fields than mathematics, listened to the address of R. C. Archibald, retiring chairman of the Section on Historical and Philological Sciences (L) and vice-president of the association. His topic was "Mathematicians, and Poetry and Drama." This session was held in conjunction with the Mathematical Association of America, the American Mathematical Society and Section L. The address, which was historical in character, brought out in charming fashion, and with evidence of deep research, many details of interest in the lives of mathematicians of note, with special reference to poetry and drama written by or about these men.

Other sessions of the Mathematical Society and the Mathematical Association were held at Williamsburg, in the historic setting of the College of William and Mary. These meetings will be reported in the official journals of those organizations.

The new officers nominated for Section A were Marston Morse for chairman of the section (and vice-president of the association), and W. M. Whyburn as an (elective) member of the section committee of Section A for a period of four years.

SECTION ON PHYSICS (B) AND THE AMERICAN METEOROLOGICAL SOCIETY

(From report of Robert G. Stone)

The Section on Physics (B) held only one session, the one on Friday evening at which the retiring chairman of the section and vice-president of the association delivered his vice-presidential address on "Auditory Patterns" (see report of General Sessions). The American Physical Society and the American Association of Physics Teachers, which normally meet with the association, met this year at the National Bureau of Standards in Washington. Lyman J. Briggs delivered an address as retiring president of the American Physical Society on "The National Standards of Measurements." The address of the retiring president of the American Association of Physics Teachers, P. W. Bridgman, was on "Society and the Intelligent Physicist." The technical program consisted of 75 papers from many branches of physics.

The American Meteorological Society held its twentieth annual meeting in three sessions, before which 14 papers were presented. The presidential address of Robert E. Horton was on "What Can We Do about the Weather?," two papers were on the future developments of meteorological methods and services, a group of papers considered the scientific aspects of the New England hurricane in September, and the remainder were devoted to a variety of subjects, such as practical applications of meteorology and climatology to aviation, public health, hydrology and weather forecasting. F. W. Reichelderfer, recently appointed acting chief of the U. S. Weather Bureau, was cordially greeted and in response paid a tribute to his predecessor, the late Dr. W. R. Gregg. C. F. Brooks was elected secretary of the society and L. T. Samuels treasurer.

SECTION ON CHEMISTRY (C)

(From report by Neil E. Gordon)

On Tuesday morning the Section on Chemistry began its program with a symposium, consisting of 5 papers, on "Reaction Rates in Organic Chemistry." Farrington Daniels, retiring chairman of the section and vice-president of the association, gave the first paper, pointing out how physical and organic chemistry can and should be correlated, translating the ideas of one into the other. He also explained how to examine especially the field of chemical kinetics in order to determine what is of practical value for organic chemistry. He showed how many types of chemical and physical techniques are used, or may be used, for following the course of a reaction, such as absorption of light, change of pressure, electrical conductivity, use of isotopic and radio-active tracers and the extension of infra-red absorption spectra.

F. O. Rice gave a brief history of the free radicals and then described the new type of technique that has been developed to determine the half-life period of the free radical.

Everett S. Wallis emphasized the now well-estab-

lished fact that the factor which in reality determines whether a molecule can undergo a chemical reaction (molecular rearrangement) is the amount of internal energy which it possesses. He contends, therefore, that the organic chemist might do well to rely less on the configuration of the organic molecule and obtain more data on reaction rates, effect of solvent, temperature, etc. He believes that from these data a truer picture of the mechanism of any molecular rearrangement can be obtained.

Gustav Egloff's paper on "Reactions of Hydrocarbons" was presented by Vasili Komarewsky, of the Universal Oil Products Company.

Edward Mack, Jr., gave the closing paper of the symposium, centering interest on a consideration of the reactivity of organic molecules as a function of their structure, fixing attention upon the question of bond strength and certain geometrical features of structure. He used carefully prepared models to illustrate certain points of his lecture.

On Tuesday afternoon, the symposium on "Natural Resins" was presented by J. N. Borglin, of the Hercules Powder Company; Wm. Howlett Gardner, of the Polytechnic Institute of Brooklyn, and S. Palkin, of the U. S. Department of Agriculture. Many of those present were pleasantly surprised by the unique methods which the speakers had used to attack their problems and the thoroughness with which they had done their work.

Following this symposium, there was a paper presented by Cranston Williams on "Dr. Herty's Method of Approaching Problems in the South." He gave a very clear picture of the life-work of Dr. Herty, especially of his work in the South, and said in closing, "Superlatives are always dangerous, but I believe the record shows Dr. Herty contributed the greatest service to the South of any person in his generation."

The symposium on Wednesday morning on "Phenanthrene and Related Compounds" had for its chairman E. Emmet Reid. The first paper was presented by Harry Sobotka on the "Physiological Chemistry of Bile Acids." He discussed the increasing number of individual bile acids which have been isolated from the bile of various animals in recent years and showed how the chemical interrelations of these acids serve as a guide to the understanding of their possible genetic relationships.

Walter A. Jacobs gave in great detail "The Chemistry of the Cardiac Glycosides," showing how there are a number of substances occurring in certain plants which he has found to possess a common characteristic action on the heart. Among these substances are digitalis and certain tropical arrow poisons.

Lyndon F. Small and Erich Mosettig presented some of the unique work which is being done at the University of Virginia. Dr. Small emphasized the "Reactions of the Alkaloids Related to Phenanthrene," while Dr. Mosettig's paper gave the recent "Advances in Synthetic Phenanthrene Chemistry." Everett S. Wallis, presenting the closing paper of the symposium, gave the preparation and also a proof of the structure of a new isomer of cholesterol, designating it as i-cholesterol.

On Tuesday evening a dinner was given by the section in honor of its retiring chairman, Farrington Daniels. The speakers at the dinner, in addition to Dr. Daniels, were Harold C. Urey, chairman of the section, and J. C. Forbes, chairman of the Richmond American Chemical Society Local Section.

The business meeting of the section committee held on Tuesday had for its main objective the planning of its meetings for the coming year. As a part of the Milwaukee meeting, from June 20 to 22, the committee formally accepted the invitation of the American Chemical Society Physical Chemistry Division to attend the symposium on "Kinetics," which will be held at that time at Madison, Wisconsin.

The section committee decided to continue the summer research conference at Gibson Island. The topics suggested for the symposia are: (1) Synthetic Resins; (2) Vitamins; (3) Chlorophyll; (4) Relation of Structure to Physiological Action, and (5) Catalysis. These symposia are planned to begin on July 10, and each symposium will be continued for a period of five days —Monday to Friday.

SECTION ON ASTRONOMY (D) AND ASSOCIATED SOCIETIES

(From reports by H. T. Stetson and Lincoln La Paz)

The widening contact of astronomy with the allied earth sciences is shown by the joint session of the section with the Section on Geology and Geography, the American Geophysical Union and the Geological Society of America for a symposium on "The Importance of Geophysics to the Study of Continental Borders." Knowledge of the deep-seated crustal structure in coastal areas depends upon both gravitational and seismic data. The possibility that precise astronomical measurements may contribute to the ultimate solution of problems of this nature was discussed, especially in connection with small variations in geographical coordinates that hint of tidal origin. The questions raised at this symposium were most timely in view of the near approach of the Seventh Assembly of the International Union of Geodesy and Geophysics, which convenes in Washington next September.

Regular sessions for the presentation of papers in Section D were held on Wednesday morning and afternoon, R. Meldrum Stewart, chairman of the section, presiding. The principal feature on Wednesday morning was the address of the retiring chairman of the section and vice-president of the association, Philip

Fox, who spoke on "Astronomers and Their Tools," tracing the development of astronomical instruments from early times to the present plans for the 200-inch telescope on Mount Palomar.

Among the more significant papers were those presented by S. A. Mitchell and other members of the staff of the Leander McCormick Observatory. The wealth of material gathered from this observatory furnished data for important contributions not only concerning the distribution of the 1,350 McCormick parallaxes, but also relative to the derivation of the visual, photo-visual and absolute magnitudes of the stars in question.

Problems of fundamental astronomy, such as new determinations of the mass of Venus and the moon from observations of the sun, were presented by H. R. Morgan and F. P. Scott, of the Naval Observatory. The sunspot cycle was discussed in a contribution by C. N. Anderson, of the Bell Telephone Laboratories.

A dinner of the section was held on the evening of December 27, at which Dr. Mitchell invited astronomers attending the meetings to visit the observatory at the University of Virginia. The average attendance at the section meetings was over 40. C. A. Chant, of the University of Toronto, was elected chairman of the section for 1939.

The sixth annual meeting of the Society for Research on Meteorites (Lincoln La Paz, reporting) was held on December 29 and 30. The 25 papers presented were the largest number in the history of the society, and the diversity of the fields represented—astronomy, geology, geophysics, metallurgy, mineralogy, mathematics, physics—emphasized most strikingly the numerous points of contact which meteoritics has with other sciences. The outstanding feature of the meeting was the joint session on Thursday morning with the Section on Geology and Geography on "Meteorites and Meteorite Impacts" and "The Carolina Bays." In the first of these discussions papers were presented by Gerhard Derge, H. H. Nininger, Lincoln La Paz, Clyde Fisher and Hans Lundberg (see report of Section E); the papers in the second were by William F. Prouty, Frank A. Milton, C. Wythe Cooke and Watson H. Moore.

There were two other sessions at which 11 papers were read on a wide variety of subjects by Joseph Kaplan (2), Lincoln La Paz (3), H. H. Nininger (2), John Davis Buddhue, Addie D. Nininger, Betty Jane Thompson and David M. Young, and 3 papers were read by title.

SECTION ON GEOLOGY AND GEOGRAPHY (E) AND ASSOCIATED SOCIETIES

(From report by Howard A. Meyerhoff)

The Section on Geology and Geography (E) met jointly with the Geological Society of America in all its sessions, and in certain of them it combined forces with other sections and societies. Starting its meetings at 9:00 A. M. on Tuesday, December 27, the section remained in continuous session until the evening of December 29. Although several of the 65 papers on the final program were only indirectly concerned with the geology and geography of the Atlantic Slope, the features and problems of the Appalachians, the Piedmont, the Coastal Plain and the Continental Shelf served as the dominant theme, unifying each and all the sessions to an extraordinary degree.

The vice-president and chairman of the section, Walter H. Bucher, presided at the opening meeting, which was held jointly with the Carolina Geological Society. The geology of the coastal plain was the subject for discussion, and the 12 papers dealt with a variety of aspects, including groundwater, stratigraphy, geophysical studies, earthquake problems, beach erosion and economic geology. The concluding papers, stressing features of the continental shelf and geophysical studies of the older rocks on which the coastal plain sediments rest, provided an appropriate introduction to the afternoon symposium on "The Importance of Geophysics to the Study of Continental Borders."

Arranged by the American Geophysical Union at the invitation of Section E, this session also involved the cooperation of the Section on Astronomy (D). Opening with a clarifying exposition of the coordinate functions of geology and geophysics, the symposium thoroughly explored the geologic facts and probabilities which recent geophysical research has disclosed regarding the history, evolution and structure of the continental margins. Shocked by news of the death, on December 24, of Dr. A. C. Veatch, the audience heard the paper prepared by him and Lieutenant Paul A. Smith with a keen appreciation of his genius, somewhat skeptical perhaps regarding the suggestion that the water level in the oceans may have been temporarily lowered as much as 12,000 feet in comparatively recent time, but thoroughly perplexed about the apparent subaerial dissection of the Atlantic border of North America, as revealed in the charts prepared by Dr. Veatch and Lieutenant Smith. The fate and present configuration of the ancient landmass of Appalachia were explored by several speakers, and the facts revealed by analogous geophysical studies along the Pacific Coast were discussed in a paper by Perry Byerly. Following a penetrating analysis of the time problem in obtaining highly accurate measurements of relative continental positions and structures, W. T. Thom summarized the accomplishments of geophysical-geological studies and ventured to predict the results which may be obtained in future research, now that the technical difficulties have been appreciated and partly overcome.

On Wednesday morning the geologists met jointly with the Section on Mathematics (A) to hear the illuminating and pertinent address of W. D. Cairns, retiring chairman of Section A, on "Seismology from the Mathematical Point of View." Fully alive to the dependence of seismological and geophysical studies on mathematics, the membership of Section E was especially appreciative of Dr. Cairns's application of his specialty to one of the earth sciences.

In a session dedicated to the memory of William Barton Rogers, the section obtained a wholesome respect for the mental energy and perspicacity of Virginia's pioneer state geologist from papers read by John Stewart Bryan, Joseph K. Roberts and Arthur Bevan. In the concluding session of the morning, Kirtley F. Mather gave a penetrating critique of modern theories of earth origin in the light of earth structures and their implications, in his retiring vice-presidential address on "Earth Structures and Earth Origins."

Wednesday afternoon, with H. W. Straley III in the chair, another joint session with the Carolina Geological Society was held to review the geology of the Piedmont and Southern Appalachians. Despite the length of the program, which contained 17 papers, an interested audience remained until the meeting ended at 6:45 P. M., while the several speakers filled in a broad canvas, involving fundamentals of pre-Cambrian igneous, metamorphic, structural and economic geology, together with new facts and problems of Paleozoic and Triassic stratigraphy, structure and sedimentation.

H. H. Nininger, president of the Society for Research on Meteorites, presided when that organization met jointly with Section E on Thursday morning. Despite the chairman's withdrawal of his own paper and the voluntary postponement of Dr. Monroe's paper, the morning was not long enough for the interesting papers and vigorous discussion. Gerhard Derge's revelation of the analogies between the structures of the metallic meteorites and certain alloys of the metals, and the significance of these analogies in interpreting meteorite origin; Lincoln La Paz's analytical study of meteorite distribution; and Hans Lundberg's exposition of geophysical research on the site of the Meteor Crater in Arizona were especially illuminating in a program of excellent papers. The joint session ended with a consideration of the Carolina "Bays" and their origin, but the profession seems no nearer a solution to this moot question than it has been at any time; for after the audience gained the conviction that William F. Prouty and his associates had virtually demonstrated their meteoritic origin, C. Wythe Cooke proposed a new non-meteoritic explanation which, in the absence of actual meteorite material, must be given careful study.

The concluding session on Thursday afternoon was concerned with the geology and geomorphology of the central and southern Atlantic states. Climate, soils, soil erosion, the mineral industry and population were among the subjects to receive general treatment; the growth of Durham, North Carolina, as an industrial center, and Hampton Roads as a shipping center made excellent subjects for detailed treatment. In the geomorphic category, coastal terraces, planes of marine erosion and the problem of Appalachian drainage and its course across the structures of the Appalachian Highlands were dealt with in specific papers. Only once did the audience digress from the main theme of the meeting—to hear Rupert B. Vance discuss with humor and keen insight "The Geography of Distinction," and even in this enjoyable paper the Southeastern States featured conspicuously. It was 6:45 P. M. before the chairman, Dr. Straley, could declare Section E adjourned until the Milwaukee meeting of June, 1939.

Despite conflicting meetings of geologists in New York and of geographers in Cambridge, Massachusetts, attendance at the sessions was good. About 250 persons were present at one or more meetings, though only twice did the number present in Lounge A at the Mosque exceed 100. The attendance record demonstrated three things: that the specialized fields and symposia to which Section E is devoting its attention at the winter meetings of the American Association are filling a definite need; that good attendance can be maintained for three days, provided good programs are planned; that some ingenuity is necessary to secure a good audience for the first meeting and to hold one through the last session.

SECTION ON ZOOLOGICAL SCIENCES (F) AND ASSOCIATED SOCIETIES

(From reports by George F. Baitsell, E. G. Butler, Ernest M. Cory, Clarence E. Mickel and O. R. McCoy

The Section on Zoological Sciences (F) met in joint sessions with the American Society of Zoologists and other associated societies at the Richmond meeting. It also joined with the Sections on the Botanical Sciences (G) and the Historical and Philological Sciences (L) in a symposium commemorating the "Centenary of the Cell Theory," which, as will be seen from the report under Section L, was of unusual importance and interest. In point of attendance and sociability the Biologists' Smoker, in which all the societies associated with the Botanical and Zoological Sections unite in a common meeting, proved as usual to outrank all other meetings. This smoker, however, has grown so large and unwieldy that it would seem as if consideration might profitably be given to some other arrange-

ment which, perhaps, might offer some improvement over the present extremely congested conditions. On the following evening the annual dinner of the zoologists was held at the Hotel Richmond with an address by the chairman of the section, F. B. Sumner, on the subject, "Human Psychology and Some Things Fishes Do."

The thirty-sixth annual meeting of the American Society of Zoologists (E. G. Butler, *secretary*) was held on December 28, 29 and 30 in conjunction with Section F and in association with several other biological societies. Of special significance were (1) the outstanding character of the three symposia, (2) the large number of general papers presented and (3) the size of the meeting from the standpoint of general attendance.

The first symposium, under the leadership of the vice-president of the society, T. S. Painter, was held jointly with the Genetics Society of America. The four participants in this symposium presented a critical review of chromosome structure. It was estimated that nearly 1,000 persons were in attendance at this symposium, which is undoubtedly the largest number ever to attend a symposium arranged by the American Society of Zoologists.

The two other symposia were organized by former presidents of the society, G. H. Parker and H. S. Jennings. Dr. Parker's symposium dealt with a review of the problem of color changes in animals, their significance and activation. Dr. Jennings's symposium included a comprehensive discussion of the recent work on mating types and their interactions in ciliate infusoria with respect to determination, inheritance and relation to sexuality.

The number of papers to be read in person was the largest which has ever appeared on the program of the American Society of Zoologists. In all, 134 papers, exclusive of demonstration papers, were presented at the Richmond meeting of the zoologists. Ten regular sessions for the reading of papers were held, in addition to the three symposia and a single afternoon demonstration session.

Although no accurate figures are available, it was estimated that approximately 500 persons attended the regular sessions of the society. The annual dinner of the American Society of Zoologists was held on Thursday evening, with 230 persons attending.

At the annual business meeting held on Thursday, December 29, the following officers of the American Society of Zoologists were elected: *President,* J. T. Patterson, University of Texas; *vice-president,* H. B. Goodrich, Wesleyan University; *treasurer,* T. C. Nelson, Rutgers University; *member of the executive committee,* M. H. Jacobs, University of Pennsylvania.

The fifty-first meeting of the American Association of Economic Entomologists (Ernest M. Cory, *secretary*) was held from December 26 to 30, with probably the largest attendance the society has ever had. The outstanding feature of the meeting was the joint symposium with the Entomological Society of America and the Ecological Society of America on Tuesday afternoon on "Insect Populations," under the chairmanship of V. E. Shelford. The following papers were presented: "Insect Population Problems in Relation to Insect Outbreaks," by Royal H. Chapman, Honolulu, Hawaii; "Population Studies of Soil Insects," by Kenneth M. King, Saskatoon, Canada; "Populations of Social Insects," by Alfred E. Emerson, Chicago; "Forest Insect Populations," by Samuel A. Graham, Ann Arbor; and "Insect Populations in Relation to Biological Control," by Harry S. Smith, Riverside, Calif.

The Economic Entomologists and the Entomological Society of America joined in a banquet on Wednesday night, at which the public address of the Entomological Society of America was presented by C. T. Brues of Cambridge, Mass., entitled "Food, Drink and Evolution." There were 325 present at the dinner. At this dinner duplicate medals were awarded to E. H. Seigler and Lyle D. Goodhue for the outstanding paper presented at the Eastern Branch meetings, "The Effect of Particle Size of Some Insecticides on Their Toxicity to Codling Moth Larvae," and the cash award was divided equally between the two authors.

There were 74 papers presented at the general sessions, and 24 on the programs of sectional meetings. A new "Section on Teaching" was organized and approved at the final business session. Supplementary conferences were held on the pea aphis and on tobacco insects by the Tobacco Insect Council.

Two hundred and ninety-seven persons registered for this association, and approximately 500 attended the symposium.

The Entomological Society of America (Clarence E. Mickel, *secretary*) held its thirty-third annual meeting on Tuesday, Wednesday and Thursday. The 32 papers presented during the regular session were about equally divided between the fields of morphology, taxonomy, physiology and ecology of insect life. One of the features of the program was the showing of color motion picture films of insect life by A. L. Melander and Mrs. C. T. Brues, with one additional film on the color vision of insects prepared by Dr. Dora Ilse, of Cambridge, England.

A joint symposium was held on Tuesday afternoon with the American Association of Economic Entomologists and the Ecological Society of America on "Insect Populations." It was pointed out in this symposium that the problem of insect populations is a fundamental one for the field of economic entomology,

and that all problems connected with outbreaks of insects are related to this basic problem of populations. The subject-matter of the symposium was presented from several points of view, namely, in relation to insect outbreaks, in relation to soil insects, in relation to forest insects, in relation to social insects and in relation to the problems of the biological control of insects. There was considerable discussion after the symposium papers had been presented, and it is hoped that one result will be the stimulation and expansion of work in this more or less neglected field. The papers presented at the symposium will be published as a single number of *Ecological Monographs* and may be secured by sending $1.00 at once to the Duke University Press, Durham, North Carolina.

The presiding officer at the Richmond meeting was President A. L. Melander. Officers for 1939 are: *President,* E. M. Walker; *first vice-president,* Ann H. Morgan; *second vice-president,* G. F. Ferris; *secretary-treasurer,* Clarence E. Mickel.

The American Society of Parasitologists (O. R. McCoy, *secretary*) held its fourteenth annual meeting on Wednesday, Thursday and Friday under the presidency of Dr. F. C. Bishopp. The program was the largest in the history of the society and contained 86 titles, representing the fields of protozoology, helminthology and medical entomology. The morning session of the opening day was devoted largely to papers on the incidence, diagnosis and treatment of human parasites. The Wednesday afternoon session consisted of reports of researches on parasites of veterinary importance and was featured by a report by R. W. Glaser and Norman R. Stoll of the cultivation in artificial media of the early parasitic stages of the sheep stomach worm, *Haemonchus contortus.* This work represents an important step toward the solution of the problem of the artificial cultivation of worm parasites, which has baffled helminthologists for a long time.

The presidential address on the subject, "Some Problems in Medical and Veterinary Entomology," was delivered by F. C. Bishopp at the conclusion of the Thursday morning session. The annual luncheon of the society, attended by 115 members and guests, was held on Thursday noon. In the afternoon, 22 papers were presented in a demonstration program during which tea was served. The concluding sessions on Friday were devoted mainly to papers on trematode life histories and to reports of immunological studies of protozoan and helminth parasites.

At the annual business meeting of the society the following officers were elected: *President,* Horace W. Stunkard; *vice-president,* Henry E. Meleney; *treasurer* for two years, Gilbert F. Otto; *members of the council* (to serve four years), E. R. Becker and E. W. Price; *members of the editorial board* (to serve four years), Asa C. Chandler, Cornelius B. Philip and E. E. Tyzzer. Colonel Charles F. Craig was unanimously elected a life member of the society. Professor Lauro Travassos, Instituto Oswaldo Cruz, Rio de Janeiro, and Dr. C. M. Wenyon, director of the Wellcome Bureau of Scientific Research, London, were elected foreign honorary members.

SECTION ON BOTANICAL SCIENCES (G) AND ASSOCIATED SOCIETIES

(From reports by J. T. Buchholz, George S. Avery, Jr., Edwin M. Betts, J. M. Schopf, H. W. Popp, Ivey F. Lewis, R. S. Kirby, F. P. Cullinan and Edgar T. Wherry)

The Section on Botanical Sciences (J. T. Buchholz, *secretary*) met in joint session with the associated societies (Botanical Society of America, the American Phytopathological Society, the American Society of Plant Physiologists, the Mycological Society of America, the Sullivant Moss Society and the American Fern Society) on Wednesday afternoon, December 28, in the auditorium of the Jefferson Hotel, with an attendance of more than 600. Dr. R. J. Pool, chairman for Section G, presided.

The program consisted of the address of the retiring vice-president and chairman for the section, Dr. F. E. Denny, of the Boyce Thompson Institute for Plant Research, and four members by invitation. Dr. Denny traced the history of the effect of ethylene on plants, first considered very harmful to greenhouse plants even in very low concentrations, later becoming known as a useful product in certain processes such as in promoting the ripening of fruits, and he has now demonstrated that ethylene is a normal product of metabolism in plants. Dr. A. F. Blakeslee discussed the present and potential service of chemistry to plant breeding, which includes the use of colchicine in the production of polyploids in a large variety of plants and greatly extends the methods available in the improvement of useful plants. Dr. W. J. Robbins described the rôle of thiamin (Vitamin B_1) in plant growth, illustrating its effect on the growth of various fungi and the excised roots of higher plants. Dr. I. W. Bailey described the microfibrillar and microcapillary structure of cell walls, with special reference to the nature and construction of the secondary wall in plant cells. Dr. A. J. Riker described the recent work on the relation between host and parasite in crown gall.

The Botanical Society of America (George S. Avery, Jr., *secretary*) held its thirty-third annual meeting from December 28 to 30, Professor Robert F. Smart, of the University of Richmond, being in charge of local arrangements for the society. The program was held under the auspices of the society's four sections, and 143 papers were presented. The annual dinner for all botanists was held on Thursday

evening at the Jefferson Hotel, which was attended by nearly 400 botanists. Arthur J. Eames, president of the Botanical Society of America, presided at the dinner and introduced Edmund Ware Sinnott, retiring president, who spoke on "The Cell and the Problem of Organization."

The following are officers of the Society for 1939: *President,* Karl M. Wiegand; *vice-president,* Merritt L. Fernald; *secretary,* George S. Avery, Jr.; *treasurer,* Paul Weatherwax; *business manager of the American Journal of Botany,* F. E. Denny; *editor of the American Journal of Botany,* Sam F. Trelease.

The General Section of the Botanical Society of America (Edwin M. Betts, reporting) held four sessions in the Jefferson Room of the Jefferson Hotel, one of which was a joint meeting with the Ecological Society of America. The papers presented at the opening session were concerned mainly with phases of sexuality and chromosome numbers in plants. Two papers dealt with sexuality in the fungus *Ascobolus.* John M. Beal, Ronald Ramford and J. T. Baldwin gave chromosome numbers in *Calochortus, Tulipa* and *Crassulaceae.* George H. Shull presented an interesting paper on a new gene mutation, *Oenothera, mut. contracta.* Two cytological papers were presented on the genus *Lilium* by O. J. Eigsti and Lewis E. Anderson, the former showing the effect of colchicine upon the division of the generative cell in the pollen tube, while Anderson concluded that both plastids and mitochondria are present in the cytoplasm of each gamete, the inclusions being derived from the generative cell.

The second session was held jointly with the Ecological Society of America, B. W. Wells, University of North Carolina, presiding. Various aspects of ecology were discussed, the papers presented running almost the entire gamut of habitats and situations.

At the Thursday afternoon session the papers read dealt mainly with the subject of morphology. Among many worthwhile papers may be mentioned: "Vascular Tissues in the Gametophyte of *Psilotum,*" by John E. Holloway; "The Types of Stigmas in the Juglandaceae," by W. E. Manning; "Development and Histology of Fruit of the Sour Cherry from Pre-bloom to Fruit Ripening," by H. B. Tukey; and "Seedling Anatomy and Classification in the *Gramineae,*" by Paul Weatherwax. As the final paper of this session, Walter T. Swingle gave an illuminating talk on "New Research Methods for the Study of Economic Plants."

The Friday morning session centered around a Symposium on Chloroplastids. Interesting papers were presented by Elliot Weier, on "Silver Nitrate Reaction and its Relation to Chloroplast Structure"; by Lewis Knudson, on "Evidence of Existence of a Membrane"; and O. L. Inman, on "The Condition of Chlorophyll in the Chloroplasts." Before the symposium, E. W. Sinnott discussed "The Relation between Cell Division, Cell Enlargement and Growth Rate," and Edwin B. Matzke and James W. Marvin gave papers on cell shapes.

Officers of the general section of the society for 1939 are: *Chairman,* P. D. Strausbaugh; *secretary,* Lewis H. Tiffany.

The Paleobotanical Section (J. M. Schopf, reporting) held the second meeting since its organization, the program consisting of scientific papers and demonstrations of fossil plant material. The occurrence of large silicified *Sequoia* stumps in the Gallatin fossil forest of Wyoming was discussed by P. A. Young. L. R. Wilson showed slides of several new species of small spores isolated by maceration from coal beds of Des Moines age in Iowa and discussed their distribution. A new *Medullosa* with two asymmetric steles was described by J. M. Schopf. Its close relationship with older English species was indicated. Charles B. Read described additional new plants from the Upper Devonian. These are allied with the Psilophytales to a considerable extent, and they indicate that there is a much less abrupt break between the Upper and Middle Devonian floras than was previously supposed. L. C. Petry read C. A. Arnold's paper on fructifications of *Archaeopteris.* From evidence presented it is indicated that *Archaeopteris* was heterosporous. Although this plant is on a fern level of organization its direct relationship may actually be with later seed plants.

Mr. Read presented a demonstration of Devonian psilophyte material. The preparations were unusual, since many of these plants are preserved in pyrite, and the structure is brought out by means of reflected illumination. Mr. Harlan P. Banks demonstrated some interesting specimens of *Protolepidodendron,* also of Upper Devonian age. Miss B. K. Stewart showed an interesting pecopterid fructification from the base of the Dunkard series in western Pennsylvania. Examples of a Pteridosperm synangium (*Dolerotheca*) and a *Mazocarpon* cone from the Calhoun locality in Illinois (middle McLeansboro age) were shown by J. M. Schopf, in addition to preparations of the new distelar *Medullosa.*

Officers of the Paleobotanical Section of the society elected for 1939 are: *Chairman,* C. A. Arnold; *secretary,* J. M. Schopf.

The program of the Physiological Section (H. W. Popp, reporting) consisted of four regular sessions, with a total of 53 papers, and three special sessions at which 18 additional papers were presented. The program for the regular sessions was carried out in cooperation with the American Society of Plant Physiologists in such a way as to avoid simultaneous sessions dealing with the same subject. To accomplish this, 14 papers of the section were transferred to the program of the American Society of Plant Physiologists, and

14 of the papers of the society were transferred to the program of the section. Of the four regular sessions of the section, one dealt chiefly with dormancy and germination (11 papers), another with water relations and translocation (13 papers), and the two remaining with growth-promoting substances (28 papers).

The subject of the first of the special sessions was "The Effects of Water-soluble Growth-promoting Substances on Plants"; of the second, "Influence of Low Temperature on Plants"; and of the third, "The Physiology and Diseases of Cotton." The second special session was carried out in cooperation with the American Society for Horticultural Science and the American Society of Plant Physiologists. The one on "The Physiology and Diseases of Cotton" was a joint session of the Physiology Section with the American Phytopathological Society and the American Society of Plant Physiologists. All sessions were unusually well attended.

The new officers of the Physiological Section for the coming year are: *Chairman,* J. M. Arthur; *vice-chairman,* E. C. Miller; *secretary-treasurer,* P. R. Burkholder; *advisory member,* Division of Biology and Agriculture, National Research Council, B. M. Duggar. The new Physiological Board members are: J. M. Arthur, *chairman;* E. C. Miller, H. S. Reed, W. J. Robbins and P. R. Burkholder.

The Systematic Section (Ivey F. Lewis, reporting) held a full program with large attendance and lively interest. The feature paper was by M. L. Fernald on "Last Survivors in the Flora of Tidewater Virginia." Many range extensions and new observations were reported. Other papers on the botany of Virginia and neighboring states were given by H. L. Blomquist, John M. Fogg, Jr., Earl L. Core, A. B. Massey, H. K. Svenson, Carleton R. Ball and Lloyd G. Carr.

Other papers concerned with the myxophyceae and diatoms were presented by Francis Drouet, E. M. West and Ruth Patrick. There was marked interest in the relation of anatomy and fundamental structure to classification. Harold A. Senn, of the Canadian Department of Agriculture, discussed the relation of anatomy and cytology to the classification of Leguminosae. Comparable fundamental papers were discussed by John T. Buchholz, James B. McNair, Vernon I. Cheadle, Fred H. Taylor and Charles Heimsch, Jr.

Considerable interest was shown in papers on exotic floras by S. F. Blake, J. P. Carabia (Cuba), F. R. Fosberg (Polynesia), T. J. Yuncker (Honduras), David Potter (Newfoundland), A. C. Smith (British Guiana). Of more varied interest were papers on the mangrove vegetation of Florida (J. H. Davis, Jr.) floristic changes in the prairie region (Raymond J. Pool) and the sedges of the Pacific Coast (J. P. Stacey).

More strictly systematic were papers by Roland M. Harper, Francis W. Pennell, H. A. Gleason and Edgar T. Wherry. Other papers ranged from stock-poisoning plants in Maryland, by George B. Reynard, to the anatomy of the spider lily seed by Muriel Whitehead and Clair A. Brown.

The program was arranged in cooperation with the American Society of Plant Taxonomists. The Taxonomists' dinner, attended by the members of the section, was featured by a most informing and interesting address by President M. L. Fernald.

Officers of the Systematic Section of the society for 1939 are: *Chairman,* John H. Schaffner; secretary, Clyde H. Jones.

The American Phytopathological Society (R. S. Kirby, *secretary*) had a successful and well-attended meeting from December 27 to 30. C. R. Orton, of West Virginia University, was elected president for 1939. Charles Chupp of Cornell University was elected vice-president, and H. W. Anderson, of the University of Illinois, and E. B. Lambert, of the U. S. Department of Agriculture, were elected councilors. Mrs. Agnes E. Meier was appointed advertising manager of *Phytopathology* and Neil E. Stevens, H. R. Rosen, F. J. Stevenson and A. J. Ullstrop were appointed as assistant editors of *Phytopathology* to fill vacancies on the editorial board.

About 250 members were present at the scientific sessions and the annual dinner was attended by approximately 360. Election of 68 new members brought the active enrolment of the society to 1,076. The scientific program included 143 papers, presented before 14 sessions, in addition to special conferences on problems relating to regulatory work and plant quarantines, on the nomenclature of plant viruses and on extension methods in plant disease control and their results.

The society, appreciating the importance for the advance of science of cooperating with scientists in related fields, held the following joint sessions with other societies: (1) On Wednesday afternoon, with the Section on Botanical Sciences and six associated societies, under the chairmanship of R. J. Pool; on Thursday afternoon, with the Section on Plant Quarantine and Inspection of the American Association of Economic Entomologists, Howard P. Barss presiding; on Friday morning, with the Potato Association of America, Donald Reddick presiding; also on Friday morning, with the Floriculture Section of the American Society for Horticultural Science, Richard P. White presiding; also on Friday morning, with the Mycological Society of America, L. O. Overholts presiding; and also on Friday morning, the Physiological Section of the Botanical Society of America and the American Society of Plant Physiologists, G. M. Armstrong presiding.

On Tuesday afternoon the society held a general

session at which 6 papers were presented. On Wednesday morning the society held a session on "Fruit Diseases," at which 11 papers were presented, E. M. Hildebrand presiding; at the same time two sessions were held, one on "Cereal Diseases," at which 12 papers were presented, J. J. Christensen presiding; and another on "Truck Crop Diseases," at which 13 papers were presented, C. C. Chupp presiding. On Thursday morning three sessions were held, one on "Tobacco Virus and Other Diseases," at which 11 papers were presented, W. D. Valleau presiding; one on "Forest Pathology," at which 12 papers were presented, Curtis May presiding; and one on "Fungicides and Miscellaneous Plant Diseases," at which 14 papers were presented, J. G. Leach presiding. On Thursday afternoon two sessions were held, one on "Virus Diseases," at which 9 papers were presented, James Johnson presiding; and one on "Tomato Diseases," at which 7 papers were presented.

On Wednesday evening the society held its annual dinner, following which it joined the Biologists' Smoker.

The American Society of Plant Physiologists (F. P. Cullinan, *secretary*) held its fifteenth annual meeting from December 28 to 30. The opening session on Wednesday was devoted to papers dealing with chlorophyll and photosynthesis, which proved to be very interesting, with reports of studies on plants ranging from the algae to full-grown apple trees. Papers on this general subject were continued at the Thursday afternoon session, showing the response of plants to differences in quantity and quality of light. The general sessions of the society on Friday dealt largely with papers on the chemical composition of plants, including vitamins, plant nutrition and plant chemistry.

In addition to the regular sessions of the society, three joint sessions were held, one on Wednesday afternoon with the botanical societies; a second on Thursday morning with the American Society for Horticultural Science and the Physiological Section of the Botanical Society of America, L. H. MacDaniels presiding; and a third on Friday morning with the American Phytopathological Society and the Physiological Section of the Botanical Society. Papers given at the Wednesday afternoon joint session with the Section on Botanical Sciences were of particular interest to plant physiologists. The Thursday morning joint session was a symposium on "The Influence of Low Temperatures on Plants," L. H. MacDaniels presiding. Papers dealing with the mechanism of cell behavior when exposed to low temperatures were considered at this session. In addition to the cellular papers, the effects on the entire plant, both herbaceous and woody, and on plant organs were discussed. The joint session held with the American Phytopathological Society and the Physiological Section of the Botanical Society of America on Friday morning proved very interesting, especially to physiologists from the cotton-producing states. The symposium subject was on "The Physiology and Diseases of Cotton," with G. M. Armstrong presiding. These papers were grouped around the development of the cotton boll and studies dealing with the root rot organism *Phymatotrichum omnivorum*, one of the destructive root rots of cotton, and and on the Fusarium wilt disease of cotton.

In addition to the papers presented in the general sessions, the society cooperated with the Physiological Section of the Botanical Society of America in an exchange of papers in order to coordinate the presentation of subject-matter and to avoid duplications in the two sections, which ran concurrently.

One of the outstanding features of the meeting was the annual dinner of the society, held in the Winter Garden Room of the Richmond Hotel on Wednesday evening, at which announcement was made of the award of the Charles Reid Barnes honorary life membership, which went to Dr. Professor Ludwig Yost, of Heidelberg, Germany.

Announcement was also made of the Stephen Hales award to John W. Shive, head of the department of plant physiology, New Jersey Agricultural Experiment Station, for conspicuous research in the field of plant nutrition.

The retiring president of the society, O. F. Curtis, presented a very stimulating paper on "Education by Authority or for Authority? Are Science Teachers Teaching Science?", in which he discussed both undergraduate and graduate teaching of the present day, giving numerous examples of the danger of teaching by authority. At the close of the dinner meeting a report on the Zurich International Cytology and Physiology Congresses was made by Basile J. Luyet, of St. Louis University, illustrated by a motion picture showing famous physiologists who were known either personally or by reputation to the members of the society.

The final session of the society, on Friday evening, consisted of a symposium on "The Teaching of Plant Physiology," Burton E. Livingston presiding.

The American Fern Society (Edgar T. Wherry, president) met on Saturday, December 31, with 30 members and guests in attendance. Talks were given on notable ferns of Virginia and adjoining states, illustrated by specimens and lantern slides. Numerous specimens and habitat photographs from other parts of the United States were also exhibited and discussed.

The Mycological Society of America held four sessions, at which 42 papers were presented, in addition to a joint session on Wednesday afternoon with the Section on Botanical Sciences and its associated socie-

ties and a joint session on Friday morning with the American Phytopathological Society.

The Sullivant Moss Society held one session, at which 12 papers were presented, in addition to a joint session with the Section on Botanical Sciences and its associated societies.

SOCIETIES RELATED TO THE SECTION ON ZOOLOGICAL SCIENCES (F) AND THE SECTION ON BOTANICAL SCIENCES (G)

(From reports by Ralph E. Cleland, Orlando Park, E. W. Lindstrom, J. E. Ackert and Paul S. Welch)

The American Society of Naturalists (Ralph E. Cleland, *secretary*), which holds an annual symposium, this year joined with the American Society of Zoologists, the Botanical Society of America, the Genetics Society of America and the Section on Anthropology (H) in a discussion on "Contributions of the Higher Animals to an Understanding of Human Biology." G. K. Noble discussed "The Experimental Animal from the Naturalists' Point of View," emphasizing and comparing social organization in the various groups from fish to man. He showed that the same components of social behavior may be recognized in the various groups and indicated how forebrain mechanisms essential for social behavior have shifted from the corpus striatum of fish and birds to the cortex of mammals. C. C. Little, presenting "Some Contributions of the Laboratory Rodents to our Understanding of Human Biology," indicated the advantages of rodents over other animals for research purposes, and outlined the major contributions to medical and biological knowledge which have resulted from their utilization. C. G. Hartman spoke on "The Use of the Monkey for the Study of Human Biology." He discussed in particular recently acquired knowledge of reproductive processes in apes and monkeys and showed how it substantiates the general conclusions with regard to the phylogenetic position of man that had previously been drawn on morphological grounds.

The presidential address was delivered by Dr. Robert M. Yerkes before a large audience at the Naturalists' dinner. This paper, entitled "The Life-history and Personality of the Chimpanzee," was illustrated by moving pictures and outlined clearly the chief physical, physiological and psychological traits of the chimpanzee.

The Ecological Society of America (Orlando Park, *secretary*) held its twenty-fourth annual meeting from December 28 to 30, at which 57 research papers and an important symposium were presented in 8 sessions. On Tuesday morning the society divided into two sections, the first on "Plant Ecology," H. C. Hanson presiding, at which papers were presented by J. E. Weaver, Raymond J. Pool, Charles J. Whitfield, Thomas F. Hull, Jr., and William T. Penfound, Frank E. Egler, Henry J. Oosting and Lewis E. Anderson, and William H. Gates. The second section on Tuesday morning was on "Animal Ecology," A. H. Wright presiding, at which papers were presented by Curtis L. Newcombe and Boland B. Shepperd, David H. Wallace, R. A. Littleford, R. V. Truitt, Z. P. Metcalf and Lee R. Dice.

On Tuesday afternoon a joint symposium was held by the society with the American Association of Economic Entomologists and the Entomological Society of America on the subject of "Insect Populations." The first of the invitational papers was on "Insect Population Problems in Relation to Insect Outbreaks," by Royal N. Chapman, and this was followed by "Population Studies of Soil Insects," by Kenneth M. King. The third paper was by Alfred E. Emerson on "Population of Social Insects," and this was followed by "Forest Insect Populations," by Samuel A. Graham. The final paper was presented by Harry S. Smith on "Insect Populations in Relation to Biological Control." Discussion of the papers at the close of the symposium was led by V. E. Shelford, presiding officer of the session.

The Wednesday morning sessions were in two sections, the first of which was on "Animal Ecology," Orlando Park presiding. Papers were presented by E. R. Dunn, Stanley C. Ball, Eugene P. Odum, S. C. Kendeigh, William C. Van Deventer and W. J. Hamilton, Jr.

The second Wednesday morning section, on "Plant Ecology," George D. Fuller presiding, opened with excellent moving pictures of Nevill's Colorado River expedition of 1938 by Elzada N. Clover. Other papers were by Moras L. Shubert and J. M. Aikman, J. M. Aikman and Richard Dilworth, R. S. Campbell, B. W. Wells, Stanley A. Cain and Olga Lakela.

The Wednesday afternoon session was also in two sections, the first of which was a joint meeting of the society with the Society of American Foresters, with C. F. Korstian presiding. Papers were presented by Hardy L. Shirley and Lloyd J. Meuli, W. E. McQuilkin, C. F. Korstian and M. A. Huberman.

The second Wednesday afternoon section was a "General Ecological Session" under the chairmanship of A. S. Pearse. At this session papers were presented by Charles C. Adams, Roland M. Harper, Edward Haskell, Stanley C. Cain, Paul D. Voth, A. P. Dachnowski-Stokes and Eldon J. Strandine.

The annual dinner of the Ecological Society of America was held on Wednesday evening, at the close of which H. C. Hanson delivered his presidential address. Following the presidential address, B. W. Wells gave an illustrated lecture on the North Carolina Transect.

On Thursday morning the society met jointly with the Botanical Society of America, B. W. Wells pre-

siding. Papers were presented at this session by Francis Ramaley, A. L. McComb, William T. Penfound, Paul D. Voth, G. S. Avery, Jr., H. B. Creighton and C. W. Hock, Paul M. Patterson, P. L. Ricker, Forrest Shreve and T. D. Mallery, John A. Small, Willis A. Egler, Morgan W. Evans and George E. Nichols.

The following officers for 1939 were elected: Charles T. Vorhies, *president;* C. F. Korstian, *vice-president;* W. J. Hamilton, *secretary.*

The Ecological Society's program closed with an all-day field trip to the Dismal Swamp.

The Genetics Society of America (E. W. Lindstrom, *secretary*) met on Wednesday and Thursday and on Friday morning, with a program of 60 papers.

Modern advances in genetic research were illustrated and discussed in two large demonstration sessions, featuring the induction of variations by colchicine treatment; polyploidy studies in many species; cytogenetical aspects of plants and animals; influence of polyploidy on sex; mutations and reverse mutations in *Drosophila;* inheritance of dental caries in rats; heredity in corneosinte hybrids; sex-determination in the Amaranthaceae; and fasciation in plants. Six invitation papers dealt with recent work on triploidy in salamanders, *Sciara* cytology, wheat cytogenetics, *Drosophila* evolutionary studies, reversal of lethal factors in *Drosophila* (showing that such lethals could not be due to deficiencies) and the effect of ultra-violet radiation on variability and mutations in the fungus causing athlete's foot. Mutations in color, colony form and growth rate of this fungus were obtained from exposures to a very narrow series of wavelengths. In a fourth session devoted to scientific papers, the following points were notable: a simple hypothesis based on the helical coiling of chromosomes to account for numerous chromosome rearrangements traceable to one hit by an x-ray quantum; the study of a monogenic base for hermaphroditism in goats interacting with the endocrines; the physiological-genetical individuality of inbred lines of corn as measured by nutrient culture studies with the nitrate and ammonium ions; a study of breeding methods in poultry; and an experiment giving proof of natural selection in the laboratory with a bacterial species whose degree of virulence and colony morphology were markedly changed by passage through resistant or susceptible maize hosts. Joint sessions were held with the American Society of Zoologists and with the American Society of Naturalists.

The attendance at the Genetics Society luncheon numbered 140.

Officers for 1939 were elected as follows: M. Demerec, *president;* Barbara McClintock, *vice-president.*

The American Microscopical Society (J. E. Ackert, *secretary*) held its annual meeting on Thursday, December 29. The reports of officers and committees showed that the society is in sound financial condition and its membership increasing. The Sixtieth Anniversary Volume (1938) of the society's quarterly Transactions consisted of 420 pages of original material on biology and microscopy.

Officers elected for 1939 were as follows: Dr. L. E. Noland, University of Wisconsin, *president;* Dr. G. W. Martin, University of Iowa, *first vice-president;* Dr. H. W. Manter, University of Nebraska, *second vice-president;* and Dr. Samuel A. Eddy, University of Minnesota, *member of executive committee.* The members chosen to represent the society on the council of the American Association for the Advancement of Science were J. E. Ackert, *secretary,* and A. M. Chickering, *treasurer.*

The Limnological Society of America (Paul S. Welch, *secretary-treasurer*) held its fourth annual meeting on Wednesday and Thursday, December 28 and 29. The scientific program consisted of 20 papers, with 6 additional papers read by title. The papers dealt with various limnological investigations, such as fresh-water medusae, bacteria of lakes, microscopic organisms of mine-waste waters, general limnological surveys of lakes, limnological methods, bottom communities of Lake Erie, investigations on the Norris Reservoir, diatomaceous deposits, sedimentary deposits in Sandusky Bay, phosphates in Chesapeake Bay and light penetration in water. A prominent feature of the program was a group of papers dealing with density currents, an outstanding one of which described underflows of sediment-laden waters in reservoirs and showed by moving pictures the behavior of density currents in specially designed apparatus.

Both sessions of the second day were devoted to a symposium on the general topic, "Some Leading Problems of Limnology with Special Reference to Lakes." This symposium consisted of 9 papers by invited speakers. In brief, the papers of this symposium dealt with such problems as the following: physical and chemical factors in the metabolism of lakes, utilization of solar energy by aquatic organisms, distribution of bacteria in lakes, relationships of phytoplankton to limnology, relation of zooplankton to the metabolism of lakes, microscopic fauna of sandy beaches, relation of rooted aquatic plants to limnology, role of bottom fauna in productivity and the position of fish and other higher animals in the economy of lakes.

The following officers were elected: *President,* L. H. Tiffany, Northwestern University; *vice-president,* G. E. Hutchinson, Yale University; *secretary-treasurer,* Paul S. Welch, University of Michigan; *elective member of the executive committee,* E. P. Cheatum, Southern Methodist University.

The National Association of Biology Teachers held two sessions, before which 8 papers were presented. On Wednesday evening it held its dinner, at which Dr. Oscar Riddle spoke on "The Opportunity and Obligations of the National Association of Biology Teachers."

SECTION ON ANTHROPOLOGY (H)

(From report by W. M. Krogman)

The sessions of the section were attended by 30 persons; 15 papers were presented, mostly on two major themes, the evolution of man and the development and adaptations of his culture.

W. K. Gregory and Milo Hellman reported on the skulls of *Plesianthropus* ("near man") found in South Africa by Robert Broom. In characters of skull-cap, face and teeth the fossils are intermediate between apes and man. Their geological age is too recent to rank them as man's ancestors; they are, rather, his cousins, and by virtue of this kinship afford valuable insight into degrees of relationship. Diamond Jenness discussed cultural origins in Asia-America contacts during prehistory. A specific tie-up between Alaska and the Amur River of Northwest Asia was indicated. E. F. Greenman and G. M. Stanley offered dated evidence of aboriginal culture in a site at Great Cloche Island on Lake Huron. The age given was 1,100 to 1,400 years ago, important in dating related cultural sequences. Leonard Bloom discussed the important problem of Indian-White cultural adjustment among the Eastern Cherokee. Four major periods were recognized: contact, 1540–1721; impact and retreat, 1721–1820; flight and precarious existence, 1820–1900; present, 1900–. R. B. Bean discussed the physical type of the Old Virginia Whites: A very tall, brown-haired, blue-eyed product of the amalgam of British, French and German settlers. The physical welfare of various racio-economic groups was outlined in the growth studies of Morris Steggerda. An annual seven-year study of Dutch (Mich.), Negro (Ala.), Navajo (Ariz.) and Maya (Yucatan) children demonstrated racial and environmental growth patterns, and contrasted the relation of individual and group growth.

In general discussion the several papers were analyzed with reference to their contribution to problems of present-day human relations. The evolutionary background, the emergency and conflict of cultures, the growth and stabilization of human types, all contribute to modern concepts of social origins and welfare.

SECTION ON PSYCHOLOGY (I)

(From report by Leonard Carmichael)

The Section on Psychology (I) reports again this year a most satisfactory series of meetings. In all more than 60 special communications, many of them of outstanding merit, were presented.

American psychologists as a whole are especially proud of the fact that this year for the first time in history the American Association Prize of $1,000 was awarded to a psychologist, presenting a paper on the program of this section. As reported elsewhere, the recipient of this prize was Professor Norman R. F. Maier, of the department of psychology of the University of Michigan. Professor Maier's prize-winning paper reported the development of "Experimentally Produced Neurotic Behavior in the Rat," the training procedures by means of which rats were deprived of their acquired modes of behavior and at the same time placed in a situation in which a positive reaction was required. As a result of this novel and ingenious treatment the rats developed a new and abnormal pattern of response. The abnormal behavior manifestations included running in circles on the floor, the demonstration of intensive ties and varying degrees of coma.

The symposium, "Research in Audition: The Next Step," organized by E. A. Culler, of the University of Rochester, was especially noteworthy. The following men participated in the symposium: J. C. Steinberg, Bell Telephone Laboratories; Don Lewis, University of Iowa; Fred A. Mettler, University of Georgia Medical School; E. G. Wever, Princeton University; E. H. Kemp, Brown University; Heinrich Kobrak, University of Chicago; Simon Dworkin, McGill University; and Walter Hughson, Abington Memorial Hospital. These investigators thus brought to bear the technique of physics, histology, electrophysiology, behavior psychology and clinical medicine in dealing with the insistent problems of normal hearing and deafness.

The retiring vice-president of Section I, Dr. Calvin P. Stone, of Stanford University, spoke at the joint dinner of the Section on Psychology and Education on "The Significance of Individual Differences in Animal Psychology." In this paper he presented much novel information on the causes of individual differences in animals, based in large part on a study of the records of race horses. Dr. Ralph W. Tyler, University of Chicago, retiring chairman of the Section on Education (Q), also presented a very important paper on "Basic Considerations in the Improvement of Educational Tests."

SECTION ON SOCIAL AND ECONOMIC SCIENCES (K)

(From report by E. P. Hutchinson)

Two papers were presented at the session on the Pareto distribution. In the first of these on "The Pareto Curve and its Social Significance for our Times," Carl Snyder presented statistical and graphical evidence of the universality of the Pareto distribution, showing how it is followed by a wide range of variables and how this form in the inequality in the

distribution of wealth and income is to be observed in all occupations, in many types of society and at many different periods. The companion paper, "Social Implications of the Pareto Distribution of Special Ability," by H. T. Davis gave a mathematical formulation of observed distributions of income and ability, and presented a statistical measure of the degree of inequality in income distribution, this latter being suggested as a possible index of social stability.

In the symposium on "Land Use," held jointly with the Section on Agriculture (O), Rupert Vance, University of North Carolina, discussed problems of southern agriculture with reference to population and land use. G. W. Forster, of North Carolina State College, presented unpublished data, indicating the necessity for a careful planning of land use for each holding. H. H. Bennett, of the U. S. Soil Conservation Service, reported on government activities in land conservation and rural rehabilitation.

The Pi Gamma Mu luncheon presented brief addresses by Sir Richard Gregory, Wesley Mitchell and F. R. Moulton.

SECTION ON HISTORICAL AND PHILOLOGICAL SCIENCES (L)

(From report by Joseph Mayer)

The sessions of Section L centered primarily upon a symposium covering the "Cell Theory"—its development, its present status and its future possibilities—and combined the best thought of the three sections (F, G and L) that collaborated in organizing and presenting it. Seven outstanding papers by eminent scholars (and an eighth which was read by title only) were presented in the two sessions devoted to the symposium. The discussion and attendance throughout were exceptionally good, over 150 being present at the afternoon meeting.

The morning session, which was devoted to historical aspects of the cell theory, brought some surprising opinions respecting Schleiden and Schwann, who for a century have been given credit for the origin of the theory. It was the unanimous opinion of Woodruff, Karling and Conklin that not only had the cell theory been formulated prior to the work of Schleiden and Schwann, but that these two men added nothing either in content or in clarity to the theory and that they, in fact, lent support to a general view of cell formation which was completely erroneous. Dr. Conklin concluded his most interesting paper by suggesting that "it would be more accurate as well as more becoming to strike out of our literature these personal possession tags attached to important discoveries, such as "The cell theory of Schleiden and Schwann" !

The afternoon session of the symposium, devoted to the present and the future of the cell theory, developed an interesting difference in points of view between those who appear to see the problem primarily in terms of physical forces (surface tensions, pressures, electrical attractions and repulsions) and those who hold that living matter exhibits certain characteristics (such as variability, selective direction and unfoldment in a temporal sequence) which sharply differentiate the organic from the inorganic. It was generally agreed that the organization of the cell is exceedingly complex and that there is still much to be learned about it. Yet, on the one hand, it was maintained by Baitsell and Schrader that the difference between the organic and the inorganic is "not one of *kind* but merely of *degree of complexity,*" and that a "dynamic hypothesis" seems the most reasonable one in explaining the complicated behavior of the cell nucleus. On the other hand, it was pointed out by Weiss and McClung that, although "the cells derived from an egg have definite, innate capacities of their own, the fact that the individual cell can differentiate in a variety of directions but actually differentiates only in one, calls for factors which direct each cell selectively into its proper course. These factors, by their very nature, are super-cellular." They apparently derive from the organism as a whole and suggest the presence of "racial material in a linear order within the chromosomes . . . since living systems have unique phenomena of a higher order (than the non-living), like reproduction, metabolism and consciousness, it is only logical to conclude that there must be units of a new order to explain them." It rests with the future, it was held, to effect a reconciliation between such points of view.

Besides the holding of the symposium on the "Cell Theory," the retiring chairman of Section L, Dr. R. C. Archibald, gave a most interesting address, illustrated with slides, on "Mathematics, and Poetry and Drama" at a joint session with Section A, the American Mathematical Society and the Mathematical Association of America. The attendance at the address was about 300.

SECTION ON ENGINEERING (M)

(From report of Frederick M. Feiker)

A half-day session of the Section on Engineering (M) was held on Thursday, December 29, on the general subject of the interrelation between "Economic Planning" and "Engineering Planning," Andrey A. Potter presiding. Three papers were presented as follows: "Engineering Planning *vs.* Planned Economy," by Dr. Joseph W. Barker, retiring chairman of the section; "Engineering Planning in its Relation to Agricultural Planning," by Professor Frank C. Vilbrandt; "The Place of the Map in our National Economy," by William Bowie, president, Society of American Military Engineers.

Dean Barker suggested that planning in an engineer-

ing sense involves the collection, coordination and interpretation of factual data in the formulation of plans to reach some objective. He pointed out that when planning involves social and economic objectives, it must depart essentially from engineering planning because there are no areas of fact for the analysis of the human equation for which factual data exist. He expressed the belief that so-called economic planning could only be true planning from the engineer's point of view if the individuals were regimented and the human factors of individuality and liberty in this way made stable. For this reason he doubted the success of a planned economy in a democratic society.

Professor Vilbrandt, in a provocative paper, suggested that agriculture and chemical engineering were finding a meeting ground in the production of raw and processed materials. He pointed out several chemical industries which were and still are in some parts of the world what he called "peasant farmer" products. His interesting analyses and parallels indicated that from the point of view of planning, changes are being made so rapidly as to outmode quickly the methods of obtaining planned objectives, and indeed may eliminate the objectives themselves.

Major Bowie's paper stressed the place of the map as a factual instrument of planning, not only for civil pursuits but for national defense.

The discussions of all three papers indicated that factual data and procedures must be greatly developed in the social and economic parts of planning, if planning in the long run is to succeed; and that engineers should cooperate with physical, chemical and social research agencies and organizations to stress the need of data so that the political agencies will not develop unbalanced plans on the basis of emotion and opinion instead of logic and facts.

Several speakers commended the leadership of the American Engineering Council in promoting interprofessional conferences on subjects of public interest in which representatives of the social sciences had opportunities to cooperate with engineers and further wider public understanding.

At the conclusion of the meeting, the delegates present discussed the opportunity to further the plans of Section M with the following results: It was voted to cooperate with the geologists and the agricultural engineers in a symposium on "Soil" at the Milwaukee meeting in June, 1939, and to look forward to possible cooperation with aeronautical sciences for a December, 1939, program at Columbus. It was also suggested that the Section on Engineering (M) might seek to further cooperation with social and physical sciences by arranging to sponsor, in cooperation with the founder engineering societies, a meeting during their annual meetings. This matter was left with Mr. Osborne, a representative delegate from the American Institute of Electrical Engineers, to explore.

Jerome Hunsaker, professor of mechanical engineering at the Massachusetts Institute of Technology, was nominated as chairman of the Section on Engineering (M) for the year 1939.

SECTION ON MEDICAL SCIENCES (N), SUBSECTIONS AND ASSOCIATED SOCIETIES

(From reports by Malcolm H. Soule, Thomas J. Hill and H. B. Haag)

The Symposium on "Mental Health" arranged by the Section on Medical Sciences was jointly sponsored by the American Psychiatric Association, the United States Public Health Service, the Mental Hospital Survey Committee and the National Committee for Mental Health. Six sessions, which ran consecutively, were held on Wednesday, Thursday and Friday, the average attendance being 175. A total of 49 papers were prepared in advance and made available in six printed brochures, one for each session. The contributions were not read at the symposium, the brochures being used as bases for discussions.

The program was inaugurated by Thomas M. Rivers, chairman of Section N. In his opening remarks Dr. Rivers criticized the setting apart of psychiatry as an isolated science. He charged the specialists to connect mental diseases with other phases of medicine and to stop overlaying this speciality with words because the impression is wide-spread that new words seemingly bring credit in psychiatry. With this challenge the symposium was introduced. The discussions that followed dealt with the genetic and biological bases of mental disorders, on the one hand, and the maladjustments between environment and biological functioning on the other. The philosophy of psychiatric research, the relationship of fundamental to applied research, the present status of psychiatric investigation and the role of academic and tax-supported research was discussed and evaluated.

The sessions on Thursday were devoted to an appraisal by statisticians, economists and social scientists of the magnitude and scope of the mental health problem, its financial and human costs, the manifold social problems associated with mental disease, their broad community and social aspects in terms of environmental causes and conditions and their modification and control. In connection with these sessions a series of excellent charts had been prepared and were mounted on display-frames about the lecture hall. In this manner the data were attractively arranged, enabling the layman to easily visualize the numerical relations. In the discussion, the enormous loss due to mental disease in terms of curtailed earning power and of public taxation for institutional maintenance was

contrasted with the contribution of economic factors to mental breakdowns through maladjustments in industry and society.

On the third day attention was focussed on the practical aspects of the management and control of mental disease and disorders, public policy in the care and treatment of the mentally ill, the organization of mental health services and related matters. Particular attention was given to the pressing need for trained workers in the mental hygiene field, and to the problem of developing a technical personnel adequate to the needs.

The symposium, the most comprehensive ever held on the subject of mental health, was an outstanding success. The discussions not only advanced scientific knowledge but served as a vehicle for the very practical purpose of promoting public interest and support looking to fruitful, nation-wide social action toward the amelioration, prevention and control of mental illness. Mental illness is a national problem and needs an alliance of medical, scientific, educational and social forces for its solution.

On Wednesday afternoon, at the close of the session devoted to "Mental Hygiene," the Theobald Smith Award in Medicine, consisting of an appropriate bronze medal and a check for a thousand dollars, was presented to Charles F. Code, of the Mayo Foundation of the University of Minnesota. In an address which followed, Dr. Code presented his findings on the distribution of histamine in the components of the blood under normal conditions and at the time of anaphylactic shock.

The address of the chairman of the section, Dr. Rivers, given on Thursday afternoon, dealt with the nature of viruses. A comprehensive survey of the methods employed for the study of submicroscopic forms was outlined, and our knowledge of these agents was presented.

The tragic death on the Hawaii Clipper of Dr. Earl B. McKinley on July 29, 1938, brought to a close the activities of one who had given unstintingly of his time and energy to the program of the Section on Medical Sciences for six years, and his great contributions were fittingly commemorated in "An Appreciation" by H. B. Ward at the close of the regular symposium program on Friday morning.

On Friday evening the symposium was brought to a close by C. Macfie Campbell, who gave an address open to the general public on "Human Needs and Social Resources."

The Subsection on Dentistry (Thomas J. Hill, reporting) held its meeting on December 28 with sessions during the morning, afternoon and evening, the presiding officers being Drs. William J. Gies, Harry Bear and D. F. Lynch, respectively.

The scientific sessions consisted of a symposium on the causes and the contributing factors related to dental caries, at which 7 papers were presented. The morning session, devoted to a discussion of the influence of "Diet and Nutrition," was participated in by J. J. Reed, R. H. Brodsky, P. E. Boyle, Meyer Klatsky, G. J. Cox, L. M. Waugh, W. A. Cotton and Mrs. Anna deP. Bowes. The influence of a wholly adequate diet as a contributing factor to the incidence of caries was repeatedly emphasized, but was shown to be inadequate for the complete control of this disease. The "Bacterial" field was discussed by Drs. J. R. Blayney, E. H. Hatton and T. J. Hill. A method for determining areas susceptible to caries by the qualitative examination of smears and the influence of saliva on cultural growth of *L. acidophilus* was demonstrated. The "Heredity" factor was emphasized by Drs. Alfred Walker, Henry Klein and H. R. Hunt, with evidence to show that in both experimental animals and humans heredity plays some part. The influence of the "Tooth Structure" on incidence of caries was discussed by F. S. McKay, and "Distribution" by Mary M. Moore and J. A. Salzmann. The "Chemical" changes in saliva and their influence upon the production of caries, as well as a comparison of the amounts of saliva excreted and the incidence of caries in endemic areas of toxic fluorosis were discussed by J. C. Forbes, H. C. Trimble, C. L. Gunn, L. S. Fosdick, H. T. Dean, H. C. Hodge and C. C. Vogt. Abstracts of these papers will appear in the *Journal* of the American College of Dentists.

The following officers of the Sub-Section on Dentistry were elected for the year 1939: Dr. Paul C. Kitchin, *chairman* and *secretary,* Drs. J. L. T. Appleton and Thomas J. Hill, *members of the executive committee.*

The Subsection on Pharmacy (H. B. Haag, reporting) devoted its entire time to the symposium on "Glycols"—their chemistry, pharmacology, industrial applications and pharmaceutical uses. F. C. Whitmore was unable to be present to discuss his phase of the subject, namely, "The Chemistry of the Glycols."

H. O. Calvery gave the results of his most comprehensive toxicity tests on these compounds (propylene glycol, diethylene glycol, ethylene glycol, carbitol, dioxide and cellosolve) in which he used some 2,600 animals. He stressed and demonstrated the need of applying statistical methods to the results of toxicity studies. In his summary he concluded that, with the exception of propylene glycol, the others should be avoided in food and drug preparations.

H. B. McClure told of the industrial applications of the glycols in a most interesting manner. Among the uses cited were, as engine coolants, low-freeze dynamites, electrolytic condensors, plasticizers and in textile manufacture.

The pharmaceutical uses of the glycols were dis-

cussed by A. G. DuMez, who gave an extensive review of the literature on this subject. In the discussion, participated in by H. B. Haag and M. G. Mulinos, the desirability of comparing the toxicity of these compounds with some generally known solvent was indicated, as well as the need for studying the factors (age, sex, their chemicals, etc.) which might influence the intensity of the glycol action.

The attendance on the symposium was very good and striking in that it stuck, there being little or no moving about during the program. This was the first time that an attempt had been made to gather together in a comprehensive fashion all that is known about the glycols, and it is hoped that the papers will be published together so as to give a complete picture of these compounds.

The American Psychiatric Association joined with the Section on Medical Sciences in the symposium on "Mental Health." It held a dinner on Wednesday evening and a meeting of its council on Thursday evening.

SECTION ON AGRICULTURE (O) AND ASSOCIATED SOCIETIES

(From reports by M. F. Morgan, H. B. Tukey and William H. Martin)

In an address on "The Inter-relation of Soils, Plant and Animal Nutrition," delivered by E. C. Auchter as retiring vice-president of the association and chairman of the Section on Agriculture (M. F. Morgan, *secretary*), the rapid expansion of research dealing with mineral nutrition of plants, animals and men was emphasized. Dr. Auchter summarized the contributions of soil scientists toward establishing areas of soils notably deficient in one or more elements essential to plants or to the well-being of animals and humans subsisting upon them.

The program of the Symposium on "Land Use" held jointly with the Section on Social and Economic Sciences (K) was described in the report of the Section on Social and Economic Sciences (K).

The American Society for Horticultural Science (H. B. Tukey, *secretary*) met in 21 sessions, at which 247 papers were presented, covering the topics of orchard soils, fertilizers and nutrition; fruit tree rootstocks and propagation; physiology and pathology of fruit plants; fruit breeding; small fruits; propagation and breeding of ornamental plants; culture, physiology and improvement of the tomato; and vegetable varieties, breeding and seed improvement. Joint sessions were held with the American Society of Plant Physiologists and the Physiological Section of the Botanical Society of America; with the Potato Association of America; and with the American Phytopathological Society. Round table discussions were held on the topics of fruit varieties; vegetable varieties; raspberry breeding; educational methods and extension methods.

The annual banquet and social evening was held at the Commonwealth Club, with J. K. Shaw, of Massachusetts State College, delivering the presidential address on "Foundations." The pleasures of the evening were further enhanced by the presence of Liberty Hyde Bailey, first president of the society 35 years previously; by the singing of the Hampton Quartet; and by the presentation of motion pictures of historic Virginia.

One of the features of the organization, and of the Richmond meeting in particular, is the general bringing together of groups from all plant sciences, including the work of soil conservationists and soil experts, plant chemists and physicists, plant breeders and geneticists, entomologists, phytopathologists, workers in applied plant propagation and workers with synthetic growth substances, and workers on general problems of nutrition, morphology and physiology. All these are united for the solution of problems concerning horticultural plants, and it is this feature of the society and of its program which is the most arresting.

The twenty-fifth annual meeting of the Potato Association of America (William H. Martin, *secretary*) was the most interesting ever held by this organization. All the sessions, including the joint sessions with the American Phytopathological Society and the American Society for Horticultural Science, were well attended and a number of excellent papers were presented. In discussing "Twenty-five Years in the History of the Potato," F. A. Krantz stated that one of the outstanding achievements of this period was the development of types of potatoes resistant to the late blight organism, *Phytophthora infestans*. Much progress has been made also in developing varieties resistant to scab and the virus diseases.

The following officers were elected: *President,* Ora Smith, Cornell University; *vice-president,* C. H. Metzger, Colorado State College; *secretary-treasurer,* W. H. Martin, N. J. Agricultural Experiment Station; *executive committee:* F. A. Krantz, L. M. Ware, R. A. Jehle and L. S. McLaine.

SECTION ON EDUCATION (Q)

(From report by Percival M. Symonds, secretary)

The Section on Education (Q) held 8 sessions, at which 40 papers were read. The attendance at these meetings ranged from 21 to 58, averaging 32. The members and guests appreciated the fact that the sessions were not overcrowded with papers and that there was opportunity for considerable free discussion from the floor.

Two of the sessions were in the nature of symposia, in which the papers were all directed toward a discussion of a single topic. One of these was on "The Economic Effects on Education," of which W. G. Carr, director of research of the National Education Asso-

ciation, was chairman. Professor Harold F. Clark, of Teachers College, Columbia University, presented a paper discussing the present status and needed investigations in this field, and the session closed with a lively discussion. The other symposium, organized by W. H. Bristow, of the National Council of Parents and Teachers, included papers on "The Problems of Interpretation of the Results of Educational Research." These reports were by representatives from foundations, state departments of education and educational associations. All stressed the importance of giving more attention to the distribution of educational research.

One of the highlights of the meetings was the reports of national and state surveys in education. F. W. Reeves discussed the work of the President's Advisory Committee on Education. H. F. Alves presented some of the findings of the Study of Local School Units in Ten States. Walter C. Eells presented the plan and some outcomes of the Cooperative Study of Secondary Schools. M. M. Chambers presented some of the outstanding results of the work of the American Youth Commission.

A joint session with the Section on Psychology (I) included 8 papers. Noteworthy among these was Gesell's review of his ten-year study of infants from early infancy on into early adolescence. The charts and figures which were presented emphasized the uniformity of this progress according to some rate or gradient which seemed to be implicit in the progress at all levels.

A program on "Problems in Reading" included 4 papers. The scheduled chairman, Emmett A. Betts, was unable to attend, his place being taken by Dr. John C. Seegers. Dr. Betts is planning to publish the papers of this session in a forthcoming issue of the *Elementary English Review*.

A round table on "Mental Hygiene in Education," with Garry C. Myers as chairman, brought an interested audience. Two short papers were presented, followed by a long period of discussion. W. Carson Ryan presented many concrete illustrations of the functions of mental hygiene in the school and classroom situation growing out of his studies in this field.

In a session devoted to "New Developments in Education," George D. Stoddard, vice-president of the section, read a report, prepared by Henry W. Holmes, of a special committee of the American Council on Education whose task it is to evaluate educational research in certain areas.

At the joint dinner with the Section on Psychology (I), there was a large and appreciative attendance. The sections were honored by having present Dr. J. McKeen Cattell, past president of the American Association for the Advancement of Science, Dr. Otis W. Caldwell, general secretary, Dr. Yerkes, of Yale University, and Dr. Woodworth, of Columbia University. The vice-presidential address of the retiring vice-president of Section I, Calvin Stone, of Stanford University, was on "Individual Differences as Points of Departure for Research in Animal Psychology." Dr. Stone reviewed tellingly some of the more striking investigations of individual differences in animal abilities. The address of the retiring vice-president of the Section on Education (Q), Ralph W. Tyler, dean of the School of Education of the University of Chicago, was on "Basic Considerations in the Improvement of Educational Tests." Dr. Tyler reviewed the work of the Committee on Evaluation of the Commission on Secondary Schools of the Progressive Education Association. Dr. Tyler discussed some of the new testing procedures which have been developed.

AMERICAN NATURE STUDY SOCIETY AND OTHER ORGANIZATIONS

(From report by Nellie F. Matlock)

The celebration of the society's thirtieth anniversary provided an added impetus for an invigorating program.

Reports were made by former presidents of the society, the outstanding one being that of Liberty Hyde Bailey, its first president, who charmed every one with reminiscences of his long and eventful life.

F. R. Moulton delivered a brief talk on "Radio Education." He was followed by C. L. Fenton, who gave a comprehensive discussion of nature books and the goals. Miss Mary Leeper, executive secretary of the Association for Childhood Education, told of her work with the association in the promoting of science education. W. C. Croxton led a discussion on the problems of nature study.

On Thursday morning the American Science Teachers Association held a session, with W. L. Eikenberry presiding, at which papers were presented by Harlan T. Stetson, Philip R. White and Charles S. Piggot. At the luncheon which followed Otis W. Caldwell presided and Wesley C. Mitchell, president of the association, spoke. At an afternoon session, presided over by Harry A. Carpenter, papers were read by Jerome Isenbarger, Hanor A. Webb and Karl F. Oerlein.

Gamma Alpha Graduate Scientific Fraternity, Sigma Delta Epsilon Graduate Women's Fraternity and Pi Gamma Mu, National Social Science Society, also held business meetings and luncheons in Richmond during the meeting of the association.

The Catholic Round Table of Science held a luncheon on Tuesday, at which "Promoting Research: Its Regional, National, and International Applications" was discussed.

The Union of American Biological Societies held a session on Wednesday afternoon at which important reports were presented.