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SCIENCE is the official organ of the American Association for the Advancement of Science. Information regarding membership in the Association may be secured from the office of the permanent secretary, in the Smithsonian Institution Building, Washington, D. C.

The growth of the association can be evidenced in

part by the statistical record of these successive meetings. In 1878 at the first St. Louis meeting 134 members were enrolled, 103 papers were listed in the program, and no associated societies are recorded in the program: the total membership is given in the report of the meeting as 558. In 1903 at the second St. Louis meeting corresponding figures are 466 members enrolled, 280 papers listed, 21 associated societies participating and a total of 4,127 in membership. At the third meeting in 1919 the enrolment is not recorded, 824 papers were listed, 25 associated societies participated and 10,272 were reported as the total membership. At the recent fourth St. Louis meeting 2,292 enrolled, 1,200 papers were listed, 47 associated societies participated and a total membership of 18,102 was reported. These figures demonstrate a consistent and rapid increase not only in the number of participants but also in the separate fields of work represented. This change in size and scope necessarily involves increase in complexity of programs and causes great difficulties in organization which may not be apparent at first glance. Thus it was necessary to provide at one time no less than sixty separate meeting rooms for sessions announced in the program, not to mention the problems associated with bringing societies and sections in proximity with each other as requested. The association has only limited need of large audience halls, demanded by many organizations even of lesser size, whereas it does call for more separate meeting rooms of moderate size than are available in many places. In this particular as in other respects St. Louis met the needs of the occasion fully, even under the unexpected situation which presented itself.

Many interests united in providing for the success of the meeting and especially three educational institutions. Oldest of these was St. Louis University, which began its work in 1818, three years before Missouri was admitted as a state. Somewhat younger is Washington University, chartered first as Eliot Seminary in 1853, and later renamed; it now has its main campus and new buildings just outside the city limits, where it cared for many sessions and organizations. The Academy of Science of St. Louis, founded in 1856, and widely known for its publications and other activities, served in many ways. Important assistance was given by the Board of Estimate and Apportionment of the City of St. Louis and by the Municipal Auditorium Commission of the City of St. Louis. Wide-spread local interest, manifested by attendance at sessions and by full reports in the local press, was also a factor in the success of the occasion.

The local committee of twenty representative citizens was organized under the chairmanship of Dr. George T. Moore, director of the Missouri Botanical Garden, with Father James B. Macelwane, of St.

Louis University, as vice-chairman and Dr. W. D. Shipton, of the St. Louis Academy of Science, as secretary. To give adequate expression to the services performed would involve listing not only the names of individual members but also the manifold duties discharged by each one before, during and even after the period of the stated meetings. To each one the association and the societies which joined in this meeting are indebted for the fine work done, without which the meeting could not have been a success. It was recalled by some that Dr. Moore had served also at the previous St. Louis meeting as local chairman, and this place was filled for the second St. Louis meeting by Professor Wm. Trelease, formerly director of the Missouri Botanical Garden. At the meeting in 1878 the secretary recorded appreciation to "Mr. Henry Shaw for his kind attention in showing the association the many beauties of his famous garden."

The registration at St. Louis reached 2,292 and was quite widely distributed. St. Louis contributed 273 of the number and other points in Missouri added 187. From other Central States Illinois registered 333, Ohio 116, Iowa 100, Wisconsin 85, Indiana 71, Minnesota 68, Michigan 60. From New York 143 were registered, from the District of Columbia and Pennsylvania 56 each, from Maryland 27, New Jersey 25 and Delaware 2. Out of the plains and mountains Kansas brought 93, Texas 53, Nebraska 52, Oklahoma 42, Colorado 33, North Dakota 11, Arizona, Montana, South Dakota and Wyoming 7 each, New Mexico and Utah 6 each and Idaho 2. The Pacific Coast was represented by California 52, Washington 9 and Oregon 8. New England furnished 50 from Massachusetts, 16 from Connecticut, 10 from Maine, 4 each from New Hampshire and Rhode Island and 3 from Vermont. From the Southern States Tennessee sent 28, Arkansas 27, Kentucky 26, Louisiana 25, Mississippi 13, Alabama, Virginia and West Virginia 11 each, Florida 10, Georgia 8, North Carolina 7 and South Carolina 3. From Canada 19 were registered, from Hawaii 2, from Mexico and Puerto Rico 1 each, and from other foreign countries 5, namely, 2 from Argentina and 1 each from Australia, France and Russia. This record shows clearly the range of interest in the meeting and of participants in its program.

The association welcomed as a guest Dr. B. A. Houssay, one of the most distinguished of South American investigators in science. Dr. Houssay is professor of physiology at the Institute of Physiology, Faculty of Medicine, University of Buenos Aires, Argentina. He is at present in the United States as visiting lecturer at several American universities. At St. Louis he gave an address at one of the afternoon general sessions and participated also in the program of the Section on Medical Sciences.

The official program was made up in the same form

as previously. Owing to the very large number of changes which had to be made at the last moment when the entire pamphlet was in proof, a few errors crept in but fortunately did not lead to serious troubles. In all some 1,200 items were included in the program, and the most important of these are mentioned in reports of secretaries included later in this article. Copies of the official program will be sent to members addressing their requests to the permanent secretary, Smithsonian Institution Building, Washington, D. C.

President Karl T. Compton, of the Massachusetts Institute of Technology, presided at the general sessions of the St. Louis meeting and contributed significantly to several of the important special programs. At the opening general session on Monday evening before a large and distinguished audience, which filled the main floor of the Opera House in the Municipal Auditorium, President Compton took the chair. Accompanying him to the stage were the speakers, officers of the association, the presidents of affiliated societies meeting with the association and members of the local committee. He called first on Chancellor George R. Throop, who welcomed the association in behalf of Washington University. President Compton then introduced Father Johnson, S.J., president of St. Louis University, who extended a welcome to the association in behalf of that institution. Next Dr. George T. Moore, director of the Missouri Botanical Garden and chairman of the local committee, was introduced and welcomed the association in behalf of the scientific organizations and the city. A hearty response to the addresses of welcome was expressed by Dr. Compton as president of the association. After these introductory features the retiring president of the association, Professor Edward L. Thorndike, of Columbia University, was presented to the audience and delivered his address on "Science and Values." After adjournment a reception to visitors, officers and members of the association and invited guests was given in the foyer of the Opera House under the auspices of the local committee.

Tuesday evening was devoted to the fourteenth annual address under the auspices of Sigma Xi. Professor G. H. Parker, president of the society, presided. The speaker was John Bellamy Taylor, of the General Electric Company, and his subject "The Electric Eye and the Human Eye."

On Wednesday evening came the first annual lecture sponsored by the United Chapters of Phi Beta Kappa. Professor R. J. Terry presided and introduced President William Allan Neilson, of Smith College, who spoke on "The American Scholar To-day."

The general session on Thursday evening was presided over by President Karl T. Compton of the association. The speaker invited for this occasion was Dr. Harold G. Moulton, president and director of the

Brookings Institution, who discussed "The Scientific Method in the Investigation of Economic Problems." Dr. Moulton contended that being scientific is a matter of spirit and not of method, and that this spirit is not the exclusive possession of the scholars in any particular realm of inquiry. Methods of investigation vary in different fields and even in a particular study. The use of the methods developed in the natural sciences are thus of limited applicability in the field of economics, and they often lead to over-simplified and misleading results when applied. He pointed out a basic difference between economics and the natural sciences. While the underlying principles of economics are based upon natural forces, the economic system is constantly undergoing evolutionary change. Whereas the natural sciences are concerned with the observation of physical forces which are of fixed and permanent character, economics is concerned with a changing world, and hence must be evolutionary in character.

Afternoon general sessions at 4:30 were devoted to special invited lectures. The first of these was given by Professor B. A. Houssay, of the University of Buenos Aires, on "The Pituitary Gland and the Metabolism of the Body." He was introduced by Dean E. B. McKinley, of Washington, D. C. Professor Houssay reviewed the fundamental work which he had carried out, demonstrating that removal of the pituitary gland relieves the diabetic symptoms resulting from pancreatectomy. He further discussed the possible mechanisms by which this is brought about and presented evidence that there is a diabetic substance present in the anterior lobe of the pituitary gland which produces its effect on carbohydrate metabolism directly and not through the mediation of the adrenal gland. On the same afternoon Professor E. H. Barbour, of the University of Nebraska, was introduced by Professor Kirtley F. Mather and spoke of his extensive collections of western fossils in an illustrated lecture on "The Proboscidea of the Plains."

On Wednesday afternoon Professor V. O. Knudsen, prize winner last year at Pittsburgh, gave on request of the executive committee of the association a lecture on the work for which the prize was awarded. His subject was "The Adsorption of Sound in Gases." Dean F. K. Richtmyer, of Cornell University, presided on Thursday afternoon, when the address was given by Dr. V. K. Zworykin, of the Radio Corporation of America, on the topic "Electron Optical Systems and Their Applications."

Among other important general events was a lecture tendered to the people of St. Louis and the members of the association through the courtesy of the National Park Service. On Wednesday afternoon in the Opera House Dr. H. C. Bryant exhibited and explained an

extraordinary series of sound films produced mostly in national parks and planned especially to portray geologic processes for educational uses.

The twelfth annual Josiah Willard Gibbs lecture, presented under the joint auspices of the association and the American Mathematical Society, was given at St. Louis by Dean Vannevar Bush, of the Massachusetts Institute of Technology. The subject of the address was "Mechanical Analysis."

A series of radio addresses was arranged by the general secretary, Dr. Otis W. Caldwell. This was opened on Monday by President Karl T. Compton with a talk over NBC on "What's New in Science." This was followed by Dean A. M. Schwitalla (St. Louis University) over NBC on "Science, Medicine and People." On Tuesday, with Watson Davis (Science News Service) as leader with nationally known scientists cooperating, a Columbia National Broadcast discussed "Science in 1935." On Friday evening Dr. Otis W. Caldwell, general secretary, in a national hook-up over NBC reviewed the work of the week as "Highlights of a Great Science Convention." At divers times during the week local broadcasts were given by workers in special fields.

EDWIN GRANT CONKLIN—PRESIDENT-ELECT OF THE ASSOCIATION

(By Austin H. Clark)

EDWIN GRANT CONKLIN, elected president of the American Association for the Advancement of Science at the St. Louis meeting, is recognized everywhere, both in this country and abroad, as one of the outstanding biologists of our time. He possesses a genius for painstaking and exhaustive work carried out with the greatest precision and with attention to the most minute detail. This work has resulted in striking and most significant discoveries which are described in memoirs and other contributions remarkable for their unusual clarity of thought and of expression. But he has never been content to restrict himself to the more or less limited field represented by his personal researches. His work has served him as a beacon to illuminate with a new light the whole field of biology and thus to give him a comprehensive and at the same time profound appreciation of life taken in its broadest sense, with special reference to its human implications. This broader vision has inspired him to make numerous and important contributions toward the end of elucidating that all-absorbing problem of man's relation to the living world.

Professor Conklin was born at Waldo, Marion County, Ohio, on November 24, 1863. He attended Ohio Wesleyan University at Delaware, Ohio, receiving the degrees of B.S. in 1885, A.B. in 1886 and A.M. in 1889. He received his degree of doctor of philosophy from Johns Hopkins University in 1891.

He was professor of biology at Ohio Wesleyan University from 1891 to 1894, and professor of zoology at Northwestern University from 1894 to 1896, at the University of Pennsylvania from 1896 to 1908 and at Princeton University from 1908 to 1933. Since 1933 he has been professor emeritus and special lecturer in biology. He received the honorary degree of doctor of science from the University of Pennsylvania in 1908, from Ohio Wesleyan University in 1910, and from Yale University in 1930, and in 1925 Western Reserve University conferred upon him the degree of doctor of laws. He gave the Lowell lectures at Harvard in 1922.

Professor Conklin's investigations have been largely in the fields of cytology, particularly cell division, and of embryology, both descriptive and experimental. His principal work in the field of embryology has been on the fertilization and organization of the egg and on the cell lineage and early development of mollusks, brachiopods and ascidians. He has followed in minute detail the change from the egg through all the successive cell divisions in order to determine to what extent adult structures can be traced back to the egg and in what form these structures appear in the egg cell. His work has all been done with great attention to detail, with extraordinary accuracy and with completeness. His papers have always been finished with artistic perfection. His work has led to important conclusions bearing on the problem of heredity.

The bearing of his work on the problem of heredity naturally aroused in him a keen interest in all aspects of that subject and also in the broader field of evolution. To this interest we owe a number of scholarly and stimulating books treating of many different phases of the subject. One of these books, "Heredity and Environment in the Development of Men," first published in 1915, is already in its sixth edition, and a French translation was published in 1920.

Professor Conklin's wide knowledge of biology, clarity of thought and soundness of conclusion have made his counsel and advice widely sought by others. He has served and is serving on the editorial boards of several scientific journals, and as a trustee or other officer of many different scientific institutions and organizations. In the association he has been since 1934 an active and valued member of the executive committee of the council, and in 1906 was vice-president of the Section on Zoological Sciences (F).

His extensive and much appreciated services to scientific journals and organizations have been accompanied by services of equal importance to the layman. Mindful of responsibilities of science to the people as a whole, he has been willing to spend a fair portion of his time making science comprehensible to the

general public through public lectures as well as by his books. Both by precept and by example his students have been taught to seek the perfected knowledge and skill of the specialist, yet at the same time to keep constantly before them the broad horizon of well-rounded culture.

Of Professor Conklin it has been truly said that "The range of his interest is as wide as life itself. He is a great scholar and a great citizen."

THE ASSOCIATION PRIZE FOR THE ST. LOUIS MEETING

A friend of the association has given funds for an annual prize of one thousand dollars. This prize is assigned by a special committee appointed each year. This is the thirteenth year in which the prize has been given, and the committee in charge was composed of F. K. Richtmyer (Cornell University), chairman, E. V. Cowdry (Washington University Medical School), B. M. Duggar (University of Wisconsin), C. N. Moore (University of Cincinnati) and Oscar Riddle (Carnegie Institution of Washington). The secretaries of the various sections and affiliated organizations are charged with the responsibility of reporting to the committee papers in the particular fields that are judged worthy of consideration for the award. The association is not asked to assume responsibility for determining the most important scientific work reported at a meeting. The committee endeavors to make the assignment to a noteworthy contribution and, so far as they can judge, the most significant report that has been brought to their attention by the secretaries.

THE ZIMMERMAN-HITCHECOCK AWARD

The committee awarded the prize at the St. Louis meeting to Dr. P. W. Zimmerman and Dr. A. H. Hitchcock, of the Boyce Thompson Institute at Yonkers, New York, for their joint paper, "Responses of Plants to Synthetic Growth Substances (Phytohormones)," which was presented before the Botanical Society of America. A brief statement of previous work and of this paper and its authors follows.

Carbon monoxide was the first pure chemical substance that was used to initiate roots on stems and leaves of plants. The original concept was that a single substance was responsible for growth—first an auxin, then auxins *a* and *b* and finally hetero-auxin was found—all these occurring in plants and acting somewhat similarly to hormones in animals. It was at first thought the auxins acted only in stimulating growth and had nothing to do with cell division. It is now found that these growth substances affect all parts of plants in many ways which involve cell extension in more than one plane, cell division in the form of proliferations or initiation of roots and also retardation of growth on aerial parts as well as on roots.

Earlier flowering is also induced on Turkish tobacco by these substances (soil treatment).

These workers and their associates were the first to show that synthetic substances not yet isolated or identified as normal constituents of plants and not regarded as auxins induced all the responses characteristic of the auxins. It must be pointed out that the physiological responses induced by the three plant auxins (*a*, *b* and hetero-auxin) are indistinguishable from one another. The phenyl compounds, phenylpropionic and phenylacrylic acids, represent a distinctly new group of compounds which was effective in causing the same types of responses as had been induced by the indole compounds. It was this finding which pointed definitely to the idea that growth substances were not specific as originally postulated, since more than one indole derivative induced certain growth responses. Also other unrelated chemical substances cause similar effects; thus when it was found that phenyl compounds induced the same responses as the indole compounds, it became a matter of importance to find new compounds which would induce similar growth responses. These workers have found a score of synthetic substances which produce effects similar to the natural plant substances.

The following is quoted from the statement by the committee of award:

It is evident that such an investigation serves notably to advance our definite knowledge of the mechanism of the complex process of growth in plants. The extension of the principle of growth induction to several groups of unrelated substances, only one of which includes the auxins, indicates indirect, or non-specific, action of all such substances. Obviously, there may be many practical applications in agriculture of some of the results obtained in plant propagation. Although these results have been obtained with plants, it is to be expected that they will ultimately be of importance in animal biology. Probably the particular "growth-promoting substances" which have been found effective in plants are chemically quite unrelated to the growth hormone of higher animals. But since the mechanism of action of the growth hormone is quite unknown, this elucidation of plant growth should contribute to an understanding of growth in animals.

Drs. Zimmerman and Hitchcock are members of the staff of the Boyce Thompson Institute for Plant Research, Yonkers, N. Y. Dr. P. W. Zimmerman, born at Manito, Ill., in 1884, was educated in the public schools of Illinois, the Eastern Illinois State Teachers College and the University of Chicago. He served as assistant in botany at the University of Chicago, professor and dean in the University of Maryland, and has been at the Boyce Thompson Institute since 1925. Dr. A. E. Hitchcock, born at Manhattan, Kans., 1898, was educated in the public schools of the District of Columbia, the Universities of Michigan and Maryland

and Columbia University. He has served as collaborator in field work in the U. S. Department of Agriculture and since 1925 has been a member of the staff of the Boyce Thompson Institute. Each of these scientists is the author of numerous research publications.

IMPORTANT COUNCIL ACTIONS

Audited financial reports of the treasurer's and permanent secretary's offices were presented and approved as audited; a digest appears later in this article. Various resolutions were adopted in the form recommended by the executive committee and are included here later. Particular attention is directed to these items which represent careful discussion and mature deliberation of committees and affiliated societies as well as of the council and deserve all the support and publicity which can be given them by members of the association. The following record concerning the St. Louis meeting was ordered spread on the minutes of the council and transmitted to the persons and organizations concerned.

The executive committee, the council, and the membership of the American Association for the Advancement of Science and its various affiliated societies are under great debt to the local committee, to the various educational and business institutions, and to the citizens of St. Louis for their unusually effective assistance in connection with the 1935-36 winter meetings of this association. The St. Louis press and to a large extent that of the whole country has given extensive and reliable reports of the scientific papers presented during the meeting. The radio broadcasts have made time assignments for numerous broadcasts regarding scientific matters.

The St. Louis local committee began its planning long ago. Diverse and heavy burdens were assumed by it and the endless details requiring the attention of its members. The facilities required by the hundreds of meetings that were involved for the various programs made it necessary for the committee to distribute its work among its own members. This was done most effectively. To each one of the entire number who cooperated so constantly and helpfully the association expresses its keen appreciation.

FINANCIAL REPORTS

The financial reports and budgets of the treasurer and permanent secretary as audited were presented, discussed and approved. They are printed below.

OFFICE OF THE TREASURER

BALANCE SHEET September 30, 1935

Assets		
<i>Investments</i>		
Securities		\$247,173.16
<i>Cash</i>		
Income account	\$ 2,992.76	
Reserve for current needs	14,198.89	17,191.65
		\$264,364.81
<i>Liabilities</i>		
<i>Endowment and Other Funds</i>		
	Research	General
W. Hudson Stephens ..		\$ 4,381.21
Richard T. Colburn ..	\$ 85,586.45	
Michael P. Rich		10,000.00

Hector E. Maiben		31,448.17	
Friends of the Association		3,559.00	
<i>Fees of Sustaining Members</i>			
Living		1,000.00	
Deceased	6,000.00		
<i>Fees of Life Members</i>			
Living		40,500.00	
Deceased	14,200.00		
	\$105,786.45	\$90,888.38	\$196,674.83
<i>Jane M. Smith:</i>			
Donation		\$ 5,000.00	
Credited fees of Deceased Emeritus Life Members		3,200.00	8,200.00
<i>Luella A. Owen</i>			
Reserve Fund			500.00
Emergency Reserve Fund			28,794.89
Prize Fund			15,536.94
Grants: Committee (L. M. Dickerson) \$	50.00		4,000.00
Affiliated Academies	1,875.00		1,925.00
			\$255,631.66
<i>Accumulated Income Unappropriated</i>			
<i>Endowment and other funds:</i>			
Research	\$ 4,477.10		
General	3,796.79	\$ 8,273.89	
<i>Jane M. Smith</i>			
		430.20	
<i>Luella A. Owen</i>			
		29.06	8,733.15
			\$264,364.81

CASH STATEMENT

October 1, 1934, to September 30, 1935

<i>Receipts</i>			
Balance from last report (September 30, 1934) ..			21,207.05
Prize fund		\$ 1,000.00	
<i>Mortgage redemption:</i>			
B. Maiben	\$ 500.00		
E. L. Scattergood	750.00	1,250.00	
<i>Life-membership fees</i>			1,200.00
<i>Bonds redeemed:</i>			
\$100.00 U. S. 1st L. L. ..	\$ 91.25		
\$5,050.00 U. S. 4th L. L. ..	5,050.00		
\$5,000.00 Pac. Gas and E. Co.	5,175.00		
\$5,000.00 So. Calif. Edison	5,078.75		
\$5,000.00 Consol. Gas and E. P.	4,925.00	20,320.00	
Premium on redemption of securities ..		731.89	
Purchased interest		289.72	
<i>Income:</i>			
<i>Endowment</i>			
Research ..	\$4,477.10		
General ...	3,796.79	\$8,273.89	
<i>Reserve Fund</i>			1,064.36
<i>Special Emergency Reserve</i>			679.59
<i>Specific Funds:</i>			
<i>Jane M. Smith</i>			
	\$ 347.04		
<i>Luella A. Owen</i>			
	21.16	368.20	10,386.04
			35,177.65
			\$ 56,384.70

Disbursements

<i>Investments:</i>			
\$10,000 Commonwealth Edison 1st 4s, 1981		\$10,414.61	
\$10,000 So. Calif. Edison 3½s, 1960 ..		9,827.04	
\$10,000 Can. Nat'l. Rwy. 4½s, 1957 ..		11,026.50	
		\$31,268.15	
Interest purchased		289.72	\$ 31,557.87
<i>Grants:</i>			
Betty Watt Brooks	\$	75.00	
Laurence M. Dickerson		50.00	
Frank G. Hall		200.00	
Roy Hertz		75.00	
Arthur H. Steinhaus		250.00	
A. G. Wilkinson for Elizabeth Dyer ..		110.00	
Ernest A. Spiegel		200.00	
A. C. G. Mitchell		100.00	
Herman D. Jones		200.00	
David I. Abramson		100.00	
H. W. Anderson		425.00	
C. L. Fenton and Mildred A. Fenton ..		100.00	
La Dema Mary Langdon		50.00	
Charles J. Lyon		50.00	
Arnold A. Zimmermann		200.00	
Wallace R. Brode		200.00	
Reginald D. Manwell		100.00	

Ronald F. MacLennan	200.00	
Connecticut College (Creighton, Avery, Burkholder)	265.00	2,950.00
Academy Grant, Howard R. Mahorner		50.00
Prize Fund, Vern O. Knudsen		1,000.00
Jane M. Smith Fund, three emeritus life mem- berships		300.00
Luella A. Owen Fund, three emeritus annual mem- berships		15.00
Hector E. Maiben lecture		271.21
Life-membership subscriptions for SCIENCE		1,506.00
Special Emergency Reserve for expenditure by Permanent Secretary		1,500.00
Safe deposit box and collection charges		42.97
	\$ 39,193.05	
Cash on hand	17,191.65	
	\$ 56,384.70	

RECEIPTS AND DISBURSEMENTS OF THE PERMANENT SECRETARY'S OFFICE FOR THE FISCAL YEAR 1934-1935
(October 1, 1934, to September 30, 1935)

<i>Receipts</i>		
To balance from last account:		
Publication fund	\$ 7,522.76	
Available for general purposes	7,949.44	
Emergency fund	5,000.00	
Special fund for committee on Place of Science in Education ..	1,696.55	
Special fund for Committee on Popu- lar Science Reading Lists	1,726.07	\$ 23,894.82
Membership dues and fees:		
Annual dues previous to 1934	260.00	
Annual dues for 1934	1,189.50	
Annual dues for 1935	79,214.00	
Advance payments for dues, etc ...	1,171.08	
Entrance fees	160.00	
Life-membership fees	1,200.00	83,194.58
Other general receipts:		
Life-membership journal subscrip- tions (from Treasurer)	1,506.00	
Interest on bank accounts, etc	912.55	
Sales of Proceedings volume	491.00	
Sales of "Stabilization of Employ- ment"	72.50	
Sales of "Nationalism"	119.00	
Sales of Booklists	1.20	
Overpayments	34.75	
Miscellaneous receipts	77.21	3,214.21
Special journal subscriptions:		
SCIENCE and SCIENTIFIC MONTHLY	2,161.00	
Science News Letter	542.00	2,703.00
Boston Meeting:		
Exhibition-receipts from exhibitors		100.00
Pittsburgh Meeting:		
Registration fees	2,771.00	
Exhibition-receipts from exhibitors, etc.	6,405.45	9,176.45
Minneapolis Meeting:		
Registration fees		417.00
St. Louis Meeting:		
Exhibitors-Initial payments from exhibitors		675.00
		\$123,375.06

<i>Disbursements</i>		
Subscriptions to official journals, including for- eign postage	\$ 50,424.80	
Division allowances	2,210.00	
Expenses of Washington Office:		
Salaries	\$16,961.19	
Office and addressograph supplies ..	408.91	
Printing and stationery	74.56	
Telephone and telegraph	171.44	
Postage	1,818.49	
Exchange	22.17	
Express, freight and drayage	27.02	
Office furniture	99.50	
Miscellaneous expenses	467.97	20,051.25
Expenses, General Secretary's office	154.61	
Expenses, Treasurer's office	200.00	
Expenses, Committee on Organization	50.86	
Circularization, inviting new members	3,650.00	
Miscellaneous expenditures:		
Life-membership fees to Treasurer. \$	1,200.00	
Refunds of overpayments	34.75	
Boston Meeting:		
Exhibition, balance	1,657.54	
Pittsburgh Meeting:		
General expenses	\$2,480.99	
Travel expenses, Execu- tive Committee	537.91	
Travel expenses, Sec- tion Secretaries	1,118.00	

Misc. expenses, Sec- tion Secretaries ...	841.97	
Exhibition	4,584.61	
Press Service	685.40	10,248.88
Minneapolis Meeting:		
General expenses	\$1,641.55	
Travel expenses, Execu- tive Committee	614.68	
Travel expenses, Sec- tion Secretaries	124.82	
Misc. expenses, Sec- tion Secretaries	51.37	
Press Service	395.74	2,828.16
St. Louis Meeting:		
General expenses	\$ 273.18	
Exhibition	1,595.07	1,868.23
Rochester Meeting:		
General expenses		50.00
Miscellaneous travel expenses		1,038.82
Printing Proceedings volume (1929-1933) (bal- ance)		7,375.92
Printing "Nationalism"		321.33
Expenses of Committee on Place of Science in Education		423.09
Expenses of Committee on Popular Science Read- ing Lists		83.68
Special journal subscriptions:		
SCIENCE and SCIENTIFIC MONTHLY .	\$2,188.00	
Science News Letter	548.00	2,736.00
		\$106,607.94
By new cash balances:		
Publication fund	\$ 637.84	
Available for general purposes	8,212.23	
Emergency fund	5,000.00	
Special fund for Committee on Place of Science in Education	1,273.46	
Special fund for Committee on Popu- lar Science Reading Lists	1,643.59	16,767.12
		\$123,375.06
Cash in banks:		
American Security and Trust Co. (Checking) .	\$ 484.87	
American Security and Trust Co. (Savings) ..	554.55	
Riggs National Bank (Savings)	190.76	
Reserve held by Treasurer	15,536.94	
		\$ 16,767.12

The accounts of the treasurer and permanent secretary were audited under the direction of Dr. W. J. Humphreys, official auditor of the association. Complete financial reports and accompanying papers are on file and copies are available if desired.

MEMBERSHIP REPORT

At the close of the fiscal year 1935 (September 30) the total paid-up membership was 15,966, representing 91.8 per cent. of the total enrolment. During the year 1,120 new members were added and 51 were reinstated by paying back dues. Names are carried on the rolls until there is an arrearage of two years. On September 30 there were 1,464 unpaid enrolments, making the total membership 17,937.

Between September 30 and January 15, 1,157 new members have been added to the rolls and 22 have been reinstated, while 888 have been removed on account of death, resignation or arrearage. The total membership on January 15 was 18,228.

THE THREE CONFERENCES

The Academy Conference met for discussion on Monday afternoon; this session was attended by representatives of some thirty academies. The program elicited vigorous participation. The opportunities are

good for a fine type of cooperative work between the various academies and the association. The secretary of this conference, Dr. S. W. Bilsing, is soon to send a full report of the meeting to each cooperating academy. The delegates and officers of the association dined together on Monday evening before the general session.

The Secretaries' Conference was scheduled to meet for luncheon on Friday and the business session convened immediately thereafter. The general secretary of the association, Dr. O. W. Caldwell, presided and handled the program prepared by the secretary, Professor M. H. Ingraham, to the satisfaction of all the 25 secretaries present. The question of establishing a new grade of membership, which had been laid over from last year, was considered and no action taken. Methods of aiding the association in extending its membership were discussed and valuable aid offered by several secretaries. The problem of securing support for publications was brought up and methods adopted by the physicists and the mathematicians were discussed in detail. Before adjournment several commented on the value to both the association and the societies of these annual conferences.

As reported last year, the Conference of Science Teachers, promoted by the Committee on the Place of Science in Education, has acquired independent status in the formation of the American Science Teachers' Association. The report of this new organization appears later in this article.

A joint conference between secretaries of sections and societies and representatives of the press was held on Friday under the leadership of Austin H. Clark, director of the press service of the association. It gave opportunity for frank and informal exchange of views with the object of securing more perfect and effective methods for securing and distributing material presented at the meetings. Much advantage has been gained by these conferences, which are growing more successful with the years. It was noted by many that the program of the St. Louis meeting was given more space and reached a larger number of papers than at any previous time.

RESOLUTIONS ADOPTED AT ST. LOUIS

A RESOLUTION ON SIMPLIFICATION OF THE CALENDAR

Approving the 12-month Equal-quarters Plan

WHEREAS, this Association is already on record as approving a simplification of the calendar; and

WHEREAS, the League of Nations in 1931 proposed two plans for serious consideration: one, the 13-month plan; the other, the 12-month equal-quarters plan known as the World Calendar; and

WHEREAS, the 12-month equal-quarters plan has the advantages of a minimum of disturbance of the present

system and greater flexibility in subdivision of the year; be it therefore

Resolved, that the American Association for the Advancement of Science hereby approves the 12-month equal-quarters plan for the simplification of the calendar.

APPEAL FOR PERMANENT SUPPORT FOR INTERNATIONAL BIOLOGICAL ABSTRACTS

WHEREAS, the American Association for the Advancement of Science has cooperated with the National Academy of Sciences and the National Research Council in the organization and development of *International Biological Abstracts* through the Union of Biological Societies, and

WHEREAS, great progress has been made in the development of international cooperation among biologists in support of this project, and

WHEREAS, The Rockefeller Foundation has generously aided this project since its beginning ten years ago and has expressed its hearty satisfaction and approval of the work thus far accomplished, and

WHEREAS, the results of a decade of intensive and largely gratuitous work by many biologists represented by the ten volumes of abstracts now nearing completion constitute one of the most noteworthy achievements of the Foundation.

Therefore, the Council of the American Association for the Advancement of Science, with its 152 associated societies representing more than one-half a million men and women of science, both in this country and abroad, urges that every possible effort be made to continue this highly important and significant undertaking and hopes that the Rockefeller Foundation will find it possible to provide for permanent continuation of *International Biological Abstracts*.

A RESOLUTION PROHIBITING UNAUTHORIZED USE OF THE NAME OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE AND CONCERNING SCIENTIFIC ETHICS AND GOOD TASTE

RESOLVED, that the American Association for the Advancement of Science does not allow the unauthorized use of its name by any individual in connection with any type of promotional enterprise or advertising. Furthermore, this Association deplores certain tendencies of some individuals and organizations to exploit science for the purposes of gain through the public press, radio, and other forms of publicity in a manner not consistent with fundamental scientific ethics and good taste.

SIMPLIFICATION OF PATENT PROCEDURE

RESOLVED, by the Council of the American Association for the Advancement of Science, representing 152 associated scientific and technical societies with an aggregate enrolment of 750,000 members, meeting at St. Louis:

WHEREAS, the progress of science has greatly elevated the standard of living of the American people, and given useful employment to millions, and

WHEREAS, for greatest benefit the applications of science in industry should be facilitated and encouraged, and

WHEREAS, the founders of this Republic instituted a patent system to encourage progress in science and useful arts, which has been a powerful aid in this respect, and which should be strengthened and maintained, and

WHEREAS, the increasing complexity of science and its applications places a great burden upon the patent office and the courts in their administration of the patent system, and

WHEREAS, the Science Advisory Board has recommended alterations in the patent system to enable it to operate more effectively for the benefit of the American inventor and the American public, which recommendations contemplate simplification of the process of litigation, scientific and technical advice to courts in the consideration of patent matters, and steps to raise the standard of invention;

Now therefore be it resolved:

1. This Council expresses the readiness of the scientific men of this country to aid in worthy moves to render the Patent System of greatest benefit to the American public.

2. This Council endorses the recommendation of the Science Advisory Board that the processes of patent litigation be simplified, in order that expenses and delay may be reduced, by prompt, enlightened decision of patent cases by a single Court of Patent Appeals.

3. This Council endorses also the recommendation that adequate scientific and technical advice, on a high plane, be made available to this court and to all courts dealing with the intricate technical problems involved in modern patent cases.

4. This Council endorses the principle that the standard of invention should be raised, and recommends careful attention to this problem on the part of those charged with the administration of the Patent Office.

THE PRESERVATION OF DIVERSE TYPES OF AMERICAN VEGETATION

The Council of the American Association for the Advancement of Science approves the formation of unofficial councils of representative citizens, such as "Save-Kentucky's-Primeval-Forest-League" with the objective of securing local, state or federal action in the preservation of important examples of America's diverse types of vegetation with their accompanying fauna. These areas should be carefully selected with competent scientific advice and preserved either through local, state or national agencies.

CONTROL OF PLANT DISEASES AND INSECT PESTS Endorsing a Resolution Adopted at the Sixth International Botanical Conference

RESOLVED, that the American Association for the Advancement of Science endorses the resolution of the Sixth International Botanical Conference held at Amsterdam, Holland, as follows:

That an effective and unceasing campaign against destructive plant diseases and insect pests can be successfully prosecuted only by international action and mutual cooperation;

That close and frequent international discussion of the problems of plant quarantines should take place to bring

about improvement of the health conditions of plants and plant products offered for export;

That it unanimously recognizes that such action will greatly facilitate international trade in the commodities concerned, and

That, finally, this resolution be brought to the attention of the League of Nations, emphatically endorsing the League's proposal to give this matter urgent and careful consideration with a view to facilitating and expediting the purpose and aims of this resolution.

CONTROL OF PLANT DISEASES AND INJURIOUS INSECTS OF FOREIGN ORIGIN, ESPECIALLY THE DUTCH ELM DISEASE

RESOLVED, that the Council of the American Association for the Advancement of Science strongly endorses the efforts of Federal and State agencies to prevent introduction of plant diseases and injurious insects from other countries and to combat most vigorously such diseases and injurious insects as have already entered the United States, especially at this time the Dutch Elm Disease.

THE ANNUAL SCIENCE EXHIBITION

(By F. C. Brown, director of exhibits)

The Annual Science Exhibition was held in the St. Louis Municipal Auditorium, from 10 A.M., Monday, December 30, to 3 P.M., Friday, January 3. There were nearly a hundred exhibits described in the general program. However, many of these comprised the efforts of cooperating institutions. For example, the American Association for Dental Research represented the work of more than a dozen institutions. Similarly the astronomy exhibits were collected from nearly as many sources. The exhibits in seismology were selected from the most important schools of the Jesuit Seismological Association. The American Nature Study Society probably collected material from more cooperating bodies than any other organization. Altogether about 200 institutions and commercial bodies were represented.

To those who have observed the exhibition in recent years, there has been not only an increase in the distinguished personnel cooperating, but also a more evident seriousness of consideration by the scientific exhibitor. The scientific exhibitors have given more care to presentation and also have provided personnel for constant supervision of the exhibits. Likewise they now remain with the exhibition from beginning to end. The commercial exhibitors also have used every care to improve their presentations. It is believed that the members of the association appreciate this expression of good will. Special thanks should be given to the local exhibition committee and most of all to its chairman, Dean A. S. Langsdorf.

Although many of the meetings were held at a great distance from the exhibition hall, practically all members of the association went to see the exhibition

and in many cases made repeated visits. Altogether about 15,000 visitors were in attendance, fairly evenly distributed from the opening until the close.

SCIENTIFIC SESSIONS

SECTION ON MATHEMATICS (A)

(Reports from E. R. Hedrick and
Edwin W. Schreiber)

The meetings of the Section on Mathematics were held in conjunction with those of the American Mathematical Society, the Mathematical Association of America and the National Council of Teachers of Mathematics.

At sessions of the American Mathematical Society from Tuesday to Thursday, over 70 papers were presented by their authors, in addition to the longer papers presented by invitation described below. Abstracts of these will be printed in the January issue of the *Bulletin* of the society, and a general account of the meeting in the March issue.

On Tuesday morning at a joint meeting of the Section on Mathematics with the National Council of Teachers of Mathematics and the Mathematical Association, Professor K. P. Williams presented a report on "The Place of Mathematics in Secondary Schools," and Professors William Betz and W. W. Hart spoke on "The Purposes and Objectives of High-School Mathematics."

On Tuesday afternoon, Professor R. D. Carmichael delivered his retiring address as vice-president of the association and chairman of the Section on Mathematics, on "Linear Differential Equations of Infinite Order." At the same session, Professor J. L. Synge spoke on "Tensorial Methods in Dynamics."

On Wednesday afternoon, Professor G. Szegő delivered an address entitled "Some Recent Investigations Concerning Sections of Trigonometric and Related Series." At the business meeting of the American Mathematical Society on the same afternoon, the following officers were elected: *Vice-presidents*, Professors E. B. Stouffer and Norbert Wiener; *secretary*, Dean R. G. D. Richardson; *treasurer*, Professor G. W. Mullins; *associate secretaries*, Professors M. H. Ingraham and T. M. Putnam; *librarian*, Professor R. C. Archibald; *member of the editorial committee of the Bulletin*, Professor D. R. Curtiss; *member of the editorial committee of the Transactions*, Professor W. C. Graustein; *member of the editorial committee of the American Journal of Mathematics*, Professor J. F. Ritt; *member of the editorial committee of the Colloquium Publications*, Professor Oswald Veblen; *members of the Council*, Professors Jesse Douglas, M. H. Stone, J. M. Thomas, T. Y. Thomas and R. M. Winger.

The twelfth Josiah Willard Gibbs Lecture of the society was delivered on Thursday afternoon in the

Municipal Auditorium, at a joint session of the society and the section, by Professor Vannevar Bush, on the subject "Mechanical Analysis," before an audience of over five hundred persons. The speaker was introduced by President Karl T. Compton. This address will appear in full in the *Bulletin* of the society.

Separate sessions of the Mathematical Association of America were held on Monday morning and afternoon with invited addresses by Professors N. A. Court, C. C. Wylie, H. J. Ettlinger, W. D. Cairns and R. W. Barnard, and a report of the Commission on the Training and Utilization of Advanced Students in Mathematics by Professor E. J. Moulton, chairman of the commission. President D. R. Curtiss made the award of the hundred-dollar Chauvenet Prize to Professor Dunham Jackson for a series of related papers on polynomial approximation; this prize is awarded every three years for a noteworthy expository paper published in English during the preceding three years by a member of the Mathematical Association. At the business meeting on Monday afternoon, the following officers were elected: *Vice-presidents*, Professor N. A. Court and Dr. T. C. Fry; *members of the Board of Trustees*, Professors G. C. Evans, W. R. Longley, E. J. Moulton and Mary E. Sinclair.

The joint session on Thursday morning with the Econometric Society and the Institute of Mathematical Statistics is reported by the Econometric Society.

On Wednesday evening, after the joint dinner of all the mathematical organizations attended by about 328 persons, the group heard the address delivered by Professor R. C. Archibald at the invitation of the National Council of Teachers of Mathematics on "Babylonian Mathematics, with Special Reference to Recent Discoveries."

For the Section on Mathematics the following officers were elected: *Vice-president of the American Association and chairman of the section*, Professor G. C. Evans; *members of the committee of the section*, Professors L. M. Graves (elective, retiring in December, 1939), M. H. Ingraham and C. N. Moore (representing the Mathematical Society), C. S. Atchison and W. D. Cairns (representing the Mathematical Association). Professor M. H. Ingraham was elected a member of the executive committee of the section.

The seventeenth annual meeting of the National Council of Teachers of Mathematics on Tuesday and Wednesday was the first annual meeting the council has held with the association. The registration was 184 and the attendance was well over 200. Tuesday afternoon was devoted to a symposium on the Teaching of Geometry. Professor W. H. Roever (Washington University) discussed "The Purpose, Nature, and Use of Pictures in the Teaching of Solid Geometry," and John T. Rule (Taylor School, Clayton,

Missouri) read a paper on "Stereoscopy as an Aid to the Teaching of Solid Geometry." The session closed with a discussion by Rolland R. Smith (Classical High School, Springfield, Massachusetts) on "Developing the Meaning of Demonstration in Geometry."

On Tuesday evening Professor Edwin W. Schreiber (State Teachers College, Macomb, Illinois) gave an illustrated lecture on "The History of the Development of the Metric System." Miss Ruth Lane (University High School, Iowa City) read a paper on "Mathematical Recreations, an Aid or a Relief?"

On Wednesday morning the following officers were elected: *Honorary president*, Professor H. E. Slaughter (University of Chicago); *president*, Miss Martha Hildebrandt (Proviso Township High School, Maywood, Ill.); *second vice-president*, Miss Mary Kelly (Wichita, Kansas); *members of the board of directors*, E. R. Breslich (Chicago), Leonard D. Haertter (Clayton, Mo.) and Virgil S. Mallory (Montclair, N. J.). The morning session closed with two papers: "Functional Thinking and Teaching in Secondary School Mathematics," by Professor H. C. Christofferson (Miami University), and "The Crisis in Mathematics—at Home and Abroad," by Professor William D. Reeve (Columbia University). A luncheon meeting was held for the official delegates and board of directors, at which Florence Brooks Miller, vice-president, presided. At the annual banquet on Wednesday evening Professor Raymond Clare Archibald (Brown University) spoke on "Babylonian Mathematics, with Special Reference to Recent Discoveries."

SECTION ON PHYSICS (B)

(Reports from Henry A. Barton, Wm. S. Webb, K. O. Lange, Eric R. Miller, Charles F. Brooks)

As usual, the meeting of the Section on Physics was held jointly with a meeting of the American Physical Society. This year the American Association of Physics Teachers also participated. The joint session was held on Wednesday morning following a business meeting of the American Physical Society and consisted of three invited papers presented under the chairmanship of Professor John T. Tate, vice-president of the section. The papers were "The Diffraction Grating," by Henry G. Gale, retiring vice-president of the section, "Optical and Physical Effects of High Explosives," by R. W. Wood, president of the American Physical Society, and "Recent Developments in Cosmic Rays," by Arthur H. Compton. Dr. Gale's paper dealt with experiments on the effects of introducing periodic errors in the ruling machine. Gratings ruled with such errors displayed very interesting optical effects, particularly as regards ghosts of spectrum lines, their position and their intensities. Professor Wood's paper dealt mainly with some ex-

periments which arose from inquiries he conducted for the Baltimore police regarding the cause of an accidental death. He determined death had been caused by a pellet from an exploding detonator cartridge. Subsequent experiments revealed the fact that the ends of these cartridges travel with a velocity several times that of a rifle bullet and receive very peculiar deformations under the pressure of the gases which propel them. Dr. Compton's paper was of the nature of a summary, bringing the results of individual cosmic ray researches up to date into reasonable relation to one another. He discussed the probability that primary radiations are for the most part electrified particles and that there exist a great multitude of secondary effects which involve not only ionized particles but photons as well.

The American Physical Society held its meetings commencing Tuesday afternoon and running through Thursday. The Tuesday afternoon session consisted of a symposium on "Photoelectricity." This was a joint session with the American Association of Physics Teachers under the chairmanship of D. L. Webster, president of that association. Three invited papers were presented, "The New Physics and the Undergraduate," by A. A. Knowlton, "Photoconductivity in Crystals," by A. L. Hughes, and "The Copper-Copper Oxide Barrier Layer," by L. O. Grondahl. On Tuesday evening, the same two societies held a joint dinner, followed by an illustrated lecture given by Dr. Thomas C. Poulter, physicist with the recent Byrd Expedition to the Antarctic, on "The Byrd Expedition in the Field."

The business meeting of the society was held on Wednesday morning; after reports from the treasurer and the managing editor, the following officers were elected: F. K. Richtmyer, *president*; H. M. Randall, *vice-president*; J. W. Beams and E. C. Crittenden, *members of the council*; H. A. Bethe, L. A. DuBridge and M. A. Tuve, *members of the board of editors of The Physical Review*.

On Wednesday afternoon three simultaneous sessions of the American Physical Society were held. One of these was devoted to magnetism and to a number of papers on electronic and photoelectric devices. At another, papers were presented on a variety of subjects dealing with sound, light, mechanics and mathematical theories. The third session was devoted largely to optical phenomena.

On Thursday morning three simultaneous sessions were again held. One of these was devoted to cosmic rays and nuclear phenomena. Another dealt almost entirely with the subject of atomic and molecular spectroscopy, while the third was mainly devoted to x-rays and crystal structure. A final single session on Thursday afternoon continued the discussion of x-rays.

The American Association of Physics Teachers held

its fifth annual meeting on December 30 and 31. The program on Monday and on Tuesday morning consisted of thirty-three papers by the membership, some of which were accompanied by demonstrations. At the business meeting of the association held on Tuesday morning, officers elected for the year 1936 were announced as follows: *President*, D. L. Webster (Stanford University); *vice-president*, F. K. Richtmyer (Cornell University); *secretary*, Wm. S. Webb (University of Kentucky); *treasurer*, P. E. Klopsteg (Central Scientific Company); *additional members of the executive committee*, S. R. Williams (Amherst College) and L. W. Taylor (Oberlin College). Considerable progress was reported on the work of publication of the book on "Demonstration Experiments," which is an association venture. The editor-in-chief of the book is Richard M. Sutton, Haverford College. Duane Roller, University of Oklahoma, was reappointed editor of the official journal of the association, *The American Physics Teacher*.

The attendance at the meetings of the American Association of Physics Teachers was the largest to date. At the sessions for the reading of papers some 175 members were in attendance, whereas at the various joint meetings over 300 were present.

The American Meteorological Society held four sessions, with 24 papers, on December 30 and 31, those on the latter date being joint sessions with the Association of American Geographers and the Section on Astronomy, respectively. Aerology, fog, international meteorology, forecasting, climatology and cycles were the chief topics discussed. S. M. Serebreny summarized the wind data above 15,000 feet obtained by pilot balloon and theodolite at the recently established New York University Institute of Aeronautical Meteorology; definite easterly components of the wind and a decrease of velocity were observed in the stratosphere. Karl O. Lange exhibited and gave an account of the development of radio-meteorographs at Blue Hill Observatory of Harvard University. One clock-driven radio-meteorograph is now being used with a 5-meter radio transmitter devised by A. E. Bent for routine ascensions with the Boston weather plane, which also carries the mechanical type used by the Weather Bureau. A 10-meter transmitter has provided accurate radio-barographic and rough temperature measurements to an altitude of 16 km in 70 min with the aid of streamlined balloons of very light weight. A new principle for radio-meteorographs, the "Lange differential meteorograph," was described, which should make this instrument much less expensive than previous types. W. R. Gregg emphasized the importance of development work on radio-meteorographs and described the successful demonstration of a radio sounding by P. Moltechanoff for his benefit at Slutzk, USSR. Fog as a hazard to aviation was

thoroughly discussed by W. H. Alexander, and a recent prolonged fog in eastern Washington associated with a stagnant anticyclone, by O. W. Freeman.

W. R. Gregg, who recently attended the sexennial meeting of the International Meteorological Organization at Warsaw, described the problems and accomplishments of this body. Claiming that nowhere can there be found such ideal cooperation as among the weathermen of all countries, Mr. Gregg showed that at Warsaw agreement was reached on all major questions, although 40 nations, speaking 18 different languages, were represented. At the last conference of 1929 at Copenhagen principles toward standardization of symbols and codes for synoptic weather mapping were laid down, and at Warsaw in 1935 specific agreement was reached on these matters. It is to be hoped that the United States will soon be able to introduce into our weather service the international figure code, which is one of the important factors of standardization. The Second International Polar Year, organized by the International Meteorological Organization, yielded a tremendous body of material to be worked up by international cooperation. The Aerological Commission introduced new regulations for quick and effective publication of aerological data. A Commission of Aeronautical Meteorology was revived in view of the urgent and manifold requirements of aviation. Radio-meteorograph developments in the different countries are watched with predominant interest by the IMO, who hope to be able to standardize aerological measurements of this kind the world over. Long-range forecasting is another problem of international cooperation, with USSR leading in the practical development.

Similar cooperation takes place among climatologists as J. B. Kincer reported in describing the proceedings of the International Climatological Commission at Danzig. A quick and efficient international exchange of climatological departures each month by radio was agreed upon. Mr. Kincer concluded his talk with a lantern slide depicting a slow but constant rise of temperature in the northern hemisphere during the last 50 years, which led to an animated discussion.

A commercial application of weather forecasts was described by Albion Davis. An extended net of rainfall observations by the Weather Bureau and company observers covers the whole region which furnishes water for the water-power plant of the Union Electric Company of St. Louis. The data from these stations are collected daily and a forecast of the runoff is prepared, which help to a large extent the full utilization of the available water power. The average saving is \$4 per \$1 spent.

In the joint session with the Association of American Geographers Eric R. Miller showed that the long-period oscillations of rainfall in the Brueckner (35-

year) cycle were opposite in the North and West to those in the South. S. S. Visser, with illustrations from Indiana, urged the use of non-average temperatures and precipitation in comparing climates. John K. Rose employed the correlation method to show definite continuation or sequential tendencies for types of monthly weather in the corn belt in summer; for example, a hot month after a dry one. C. J. Bollinger, on another line of seasonal forecasting, showed certain apparent influences of sea temperature anomalies in the Gulf of Mexico on the seasonal rainfall and temperature departures in the Southwest. J. C. Jensen made a contribution to the problem of the effect of local evaporation on the quantity of rainfall, a topic hotly discussed at the Pittsburgh meeting. He presented his detailed observations of last summer in the northwest Minnesota lake region. On the basis of a detailed analysis of the weather in relation to vegetation year by year C. W. Thornthwaite presented the poor agricultural prospects of portions of the Great Plains. In another paper on the Great Plains, E. E. Lackey showed dates of varying degrees of frost hazard. John Leighly demonstrated how to determine analytically the average dates of the extremes of the annual temperature march. J. B. Kincer, in discussing the organization and work in climatology and agricultural meteorology in several countries of Europe, showed that the United States led in the immediacy if not the volume of publication. He also described the great voluntary climatic network of the United States and paid his compliments to a number of observers whose generous public service had extended over 45 and even 50 years and more.

A report on the joint session of the society with the Section on Astronomy is given under that section.

At the annual business meeting the secretary reported a large increase in membership and an enlargement of the society's *Bulletin*, and the treasurer told of the satisfactory financial condition of the society. J. B. Kincer was elected *president* and Burton M. Varney *vice-president* for 1936-37; Charles F. Brooks was reelected *secretary* and LeRoy T. Samuels succeeded W. R. Gregg as *treasurer* for 1936; C. D. Reed, C. F. Marvin, R. H. Weightman, W. I. Milham and W. C. Haines were elected *councilors* for 1936-38. Appreciations were voted to W. R. Gregg, retiring treasurer, and to Dr. I. M. Cline, retiring president, and Dr. W. J. Humphreys, past president, both of whom were retiring from the U. S. Weather Bureau after a long period of public service.

SECTION ON CHEMISTRY (C)
(Report from J. H. Simons)

This section opened its meeting on Tuesday afternoon when Professor Joel H. Hildebrand gave the retiring vice-presidential address on the topic, "Dipole

Attraction and Hydrogen Bond Formation in Their Relation to Solubility." From numerous examples he pointed out that dipole moment considerations could not completely justify solubility relationships, but that other factors must be considered. It was shown that chief among these was the tendency to form hydrogen bonds between molecules.

The symposium on "The Teaching of Chemistry" held on Wednesday afternoon jointly with the Section on Education and the Division of Chemical Education of the American Chemical Society was opened by Ross A. Baker, who acted as chairman. He spoke on "The Objectives of the Subject of Chemistry," and emphasized the value of the laboratory work. J. H. Simons then spoke on the subject, "Teaching Chemistry for Its Cultural and Training Values." "Teaching Chemistry for Its Prerequisite and Professional Values" was discussed by J. C. Bailar. He emphasized the value of considering problems in other fields as chemical problems and of thinking in chemical terms. In a paper on "The Problem of the Laboratory and Lecture Demonstration" H. G. Deming again brought out the fact that the scientific method of thought is just clear thinking. W. D. Harkins spoke on "Keeping Chemistry Teaching and the Text Books Modern," and pointed out that nothing should be included in a course just because it is new nor left out just because it is old. "Special Problems in the Teaching of Chemistry" was the title of an address by Warren C. Johnson. Among other things he discussed the segregation of students on the basis of ability, the reconstruction of the laboratory work of the general course and the teaching of the elementary course by starting with the theoretical aspects.

This was the second of a series of three symposia on topics of mutual interest to chemistry and education. The third will be held at the 1936 meeting.

The session for contributed papers on Thursday afternoon was opened by J. Willard Hershey with a paper on "The Effects of Synthetic Atmosphere of Nitrous Oxide and Oxygen upon Animal Life." Three papers followed relating to substances of biological importance. P. Rothmund spoke about the synthesis of porphyrin compounds, which are related to chlorophyll and the blood pigments. Herbert M. Evans reported upon the isolation of an alcohol, tokopherol, from wheat germ oil having the physiological properties of vitamin E, and W. M. Stanley reported the isolation of a protein in crystalline form which is apparently the tobacco-mosaic virus. Robert E. Cuno and his father, Chas. W. Cuno, reported respectively on the vacuum extraction of drugs and upon silicosis. B. Clifford Hendricks spoke about the examinations for general chemistry, and E. J. Allen discussed the use of arithmetic in elementary chemistry.

On Thursday evening a dinner was held jointly with the St. Louis section of the American Chemical Society, and after the dinner W. D. Harkins addressed a large audience upon the subject of "Nuclear Chemistry, Neutrons and Artificial Radioactivity."

SECTION ON ASTRONOMY (D)
(*Report from Harlan T. Stetson*)

Well-attended meetings of this section were held on Tuesday and Wednesday. Twenty-two papers composed the program. They varied in interest from the discussion of meteors to tides in extra-galactic nebulae.

The meeting on Tuesday afternoon was a joint session with the American Meteorological Society, at which topics of interest in the fields bordering astronomy and earth science were discussed. Two items on this program deserve special mention. Dr. R. H. Goddard (Clark University) gave a scientific account of his experiments in developing rockets for exploration of the upper atmosphere. His account featured the success that had been obtained in applying the principles of gyroscopic control in directing the flights of rockets at his field station in New Mexico. His talk was illustrated with many slides and a motion picture film depicting not only the technique of the firing but also the actual track and behavior of the rocket in the atmosphere. The methods already developed give promise of the rocket's usefulness in future investigations of the upper atmospheric layers. An address by Dr. C. G. Abbot on "Periodic Solar Variations and Associated Weather Phenomena" followed, in which the latest results of the Smithsonian Institution were given, adding the evidence of recent years of observation to the theory of fluctuations in the solar constant as affecting changes in the weather. A paper by H. W. Clough described recent maximum and minimum epochs of the 2½-year period in solar and meteorological phenomena.

Following the joint session, Professor Frederick Slocum (Wesleyan University) delivered his address as retiring vice-president of the section. This lecture was a feature of the general program of the meeting of the association and was given before an audience that taxed the seating capacity of the room. Dr. Slocum chose as his subject "The Changing Picture of the Universe" and clearly summarized the progress in man's conception of the universe from the philosophy of the early Greeks to that of Einstein, Eddington and LeMaitre.

Two outstanding papers of the Wednesday morning session closed the formal program. The first of these was by Professor E. F. Carpenter (Steward Observatory, Tucson, Arizona) on the question of "Tides in Extra-Galactic Nebulae." Dr. Carpenter presented evidence from the results of plates made with a 36-inch reflecting telescope that many twin extra-galactic

nebulae were physical doubles. Although tidal forces in the relatively close pairs were ten thousand times greater than the tidal forces operating in pairs of more distant spirals, the forms of which Sir James Jeans attributes to tidal causes, Dr. Carpenter failed to find in these any evidence of tidal distortions. It would appear that the tidal theory in regard to spirals will have to be revised if further researches substantiate Professor Carpenter's findings.

The final paper by Dr. E. C. Slipher (director of the Lowell Observatory) exhibited the occurrence of both clouds of vapor and dust storms in the atmosphere of Mars.

The photographs on which the deductions were based were of the usual excellent quality characteristic of the painstaking work of the Lowell observers and consisted of exposures made with red, yellow and blue filters. The interpretation of the surface features was facilitated by the comparison of similar terrestrial exposures of the San Francisco peaks made under comparable conditions in the earth's atmosphere.

Supplementing the astronomical interests represented in the section was the Astronomical Exhibit at the Municipal Auditorium. The leading attraction was the working model of the new McDonald Observatory of the University of Texas, which was loaned and exhibited through the courtesy of the Warner and Swasey Company of Cleveland. The major space in collections of photographs from observatories was given to the exhibits of the Carnegie Institution of Washington, Mount Wilson Observatory, Lowell Observatory of Flagstaff, Arizona, and of the Sproul Observatory of Swarthmore College. The interest of amateurs was well displayed through the cooperation of Mr. Leo J. Scanlon, of Pittsburgh, and Mr. J. Wesley Simpson, of St. Louis.

SECTION ON GEOLOGY AND GEOGRAPHY (E)
(*Reports from Kirtley F. Mather, Guy-Harold Smith, William J. Berry, F. W. Sohon*)

This section held two sessions during the forenoon of Monday and of Tuesday under the chairmanship of Dr. Walter E. McCourt (Washington University), vice-president and section chairman. The Monday morning meeting was a joint session with the Seismological Society of America and was featured by the address of the retiring vice-president, Professor James B. Macelwane (St. Louis University) on "Problems and Progress on the Geologico-seismological Frontier." The conclusion was announced that the study of deep-focus earthquakes suggests crystallinity and strength as attributes of the earth materials at depths of a few hundred kilometers. The existence of an earth core may be sure and its approximate diameter known, but as yet there is no method available for determining earthquake velocities within it. There

seems to be evidence for the transmission of sheer waves through the core but as yet no certainty that such is the case. This address will be published in full in *SCIENCE* at an early date.

Other papers read at this joint session included a report by E. A. Hodgson on the earthquake of November 1, 1935, which was felt generally throughout the northeastern part of the United States and eastern Canada. This was a deep-focus quake with its epicenter now definitely located a few miles northeast of Temiskaming, Ontario. N. H. Heck and H. E. McComb, of the U. S. Coast and Geodetic Survey, presented some observations on recent progress in seismology with special reference to the improvements in equipment at several seismograph stations and to the instrumental studies made in connection with the earthquakes at Helena, Montana.

Monday afternoon a trip was taken to Florissant to inspect the instruments and vault of the seismograph station maintained there by St. Louis University under the direction of Father Macelwane. Many members of the section attended the dinner of the Seismological Society that evening.

The papers read at the Tuesday morning session covered a wide range of topics, from the commercial iron sulphide deposits of the northern Ozark plateau, by Oliver R. Grawe (Missouri School of Mines), to a review of the present status of knowledge concerning the conodonts, by E. B. Branson and M. G. Mehl, and a paleobotanical contribution concerning the trochiliscids, by R. E. Peck (all of the University of Missouri). Much interest was displayed in the description by Wallace W. Atwood, Jr., of the glacial and volcanic history of the mountain which formerly occupied the site of Crater Lake, Oregon. The oil paintings by Eugene Kingman with which this paper was illustrated set a new standard for graphic presentation of the data of geologic history. Abstracts of all papers presented at the meeting will be published in February in the *Proceedings* of the Geological Society of America.

The thirty-second annual meeting of the Association of American Geographers was held on Monday, Tuesday and Wednesday. In the three-day session sixty-nine papers were read, in addition to three memorials and the presidential address. The papers included six in the field of geomorphology, ten in meteorology and climate, twenty-two in regional geography, six in the field of population, two in cartography and eight on regional and national planning; five treated of research techniques and the remainder represented many other topics. On Tuesday morning the association and the American Meteorological Society met in a joint session. On Tuesday evening the retiring president, Professor Charles C. Colby (University of Chicago) addressed the association and guests on the

subject, "Changing Current of Geographical Thought in America." Wednesday morning was devoted to a symposium on "Land Utilization" with papers by Professor Lester E. Klimm (University of Pennsylvania), Professor H. M. Leppard (University of Chicago), Professor Loyal Durand, Jr. (University of Wisconsin), Dr. G. Donald Hudson (Tennessee Valley Authority) and Professor K. C. McMurtry (University of Michigan). The following officers were elected for 1936: *President*, Professor W. H. Hobbs (University of Michigan); *vice-president*, Dr. John K. Wright (American Geographical Society); *secretary*, Professor P. E. James (University of Michigan); *treasurer*, Professor John E. Orchard (Columbia University); *councillors*, Col. Claude E. Birdseye (U. S. Geological Survey), one year and Professor R. J. Russell (Louisiana State University), three years.

The National Council of Geography Teachers met from December 28 to 30, the conference being held in part conjointly with the Association of American Geographers. Attendance was especially large, probably the largest of all National Council conferences to date. For the most part each session was devoted to a single theme, thus permitting in the five sessions a considerable variety of major topics. These were in the order of the sessions: (1) the teaching of geography in the lower elementary grades, (2) geography in the senior high schools, (3) publicizing geography, (4) professionalization of subject-matter and (5) geography in world relations.

The speakers on the first of these topics pointed out a decided lack of uniformity in subject-matter and teaching techniques and thus indicated the need for much further investigation. The second topic proved to be the most significant of the five, since both laymen and school executives seem interested in the contributions of geography to public education. It was stated that, due in part at least to paucity of well-trained teachers, to the shortage of texts in certain lines of the subject and to a measure of inertia, geography as a high-school subject has not expanded as might have been expected. Especially noteworthy in the second session was the paper on political geography by Past-president N. A. Bengtson. The third topic stressed particularly the importance of making known, through effective teaching, through participation in various public activities and through personal contacts, the utility of geography. In addition Helen Strong (National Resources Board) pointed out many significant benefits resulting from the work of geographers in the various planning boards and other governmental agencies.

The fourth subject was discussed by DeForrest Stull (Columbia University) and J. R. Whitaker (University of Wisconsin) and summarized by Edith Putnam Parker (University of Chicago). At the

same session President R. G. Buzzard (Southeastern Illinois State Teachers College) commented upon the functions and activities of the collegiate geographic fraternity, Gamma Theta Upsilon. Noteworthy contributions from Drs. O. W. Freeman, J. E. Switzer, S. Van Valkenberg and Wallace W. Atwood, Sr., dealt with geography in world relations.

At the annual banquet Dr. Edwin J. Reeder (University of Vermont) addressed the council on the subject, "Are Geographers Fiddling while Rome Burns?" Dr. Reeder stressed the necessity of handling geography as a development subject rather than in catalog fashion or as pure description, and brought out the importance of teaching the best utilization and adaptation of natural surroundings and resources.

The Distinguished Service Award was conferred upon Dr. Douglas Clay Ridgley in recognition of his outstanding services to educational geography through years of inspirational teaching and numerous publications.

Additional features of the conference were an address by Superintendent Henry J. Gerling of the St. Louis schools in which he pointed out the aims of geography teaching in the schools of the city, and a field trip on Sunday conducted by Dr. Lewis F. Thomas, to observe some of the major industrial and specialized agricultural forms of the metropolitan region.

The Seismological Society of America met in a joint session with the Section on Geology and Geography on Monday morning. A trip to the Florissant Seismograph Station occupied the afternoon and was followed by a dinner in the evening. The society met separately on Tuesday, Captain N. H. Heck, chairman of the Eastern Section, presiding. He gave a very detailed and encouraging picture of the present state of the work in seismology, and the papers of the St. Louis group showed how with improved time control and better instruments more refinements could be made in the interpretation of records than heretofore and conclusions drawn as to the velocities and surfaces of discontinuity within the earth. Dr. F. Wenner (National Bureau of Standards) showed some records taken simultaneously from different types of seismometers which he had assembled side by side on his shaking table. He emphasized the fact that these records showed that the seismogram was far from being a true picture of the earth motion. On the other hand, the paper of Mr. A. Blake (U. S. Coast and Geodetic Survey) showed that with instrumental constants known, seismograms could be reduced, though not without considerable labor, so as to yield the information that engineers and architects needed to have. Contrary to expectations, the preliminary report on the microbarograph seemed to show no connection be-

tween microseismic activity and barometric fluctuations. It is hoped that the papers will be published in the *Bulletin of the Seismological Society of America*.

SECTION ON ZOOLOGICAL SCIENCES (F)

(Reports from George R. La Rue, H. B. Hungerford, A. I. Bourne, H. W. Stunkard, Lawrence E. Hicks)

The Section on Zoological Sciences held joint sessions with the Section on Botanical Sciences, with the Section on Medical Sciences and with affiliated societies from Tuesday to Thursday. The annual dinner for all zoologists was held on Wednesday night with an attendance of about 175. Following the dinner Dr. Oscar Riddle (Carnegie Institution) gave the vice-presidential address on the subject, "The Confusion of Tongues." The complete address has been published in *SCIENCE* for January 17 and 24.

The program contained 76 titles, exclusive of those appearing on joint programs. Of these 47 were read and 22 presented by demonstration. The high quality of the demonstrations was a matter of comment. At the joint session with the Ecological Society of America ten papers on animal ecology and field zoology were read. The joint program with the American Society of Parasitologists and the Section on Medical Sciences included as special features four invited papers and the address of Colonel Charles F. Craig, president of the Society of Parasitologists, on the subject, "Some Unsolved Problems in the Parasitology of Amebiasis."

The joint session with the Genetics Society of America, the Systematic Section of the Botanical Society of America and the American Society of Naturalists was devoted to a round table discussion on "Species from a Genetic Standpoint." This session was led by Dr. L. J. Stadler, while Drs. J. Clausen, Th. Dobzhansky and Sewall Wright served as introducers.

The Entomological Society of America held its thirtieth annual meeting on Monday and Tuesday. During the regular two-day sessions there were presented 45 papers. The annual address was given by Mr. Curtis P. Clausen (Bureau of Entomology, Washington, D. C.). Mr. Clausen, who has had many years' experience in insect parasite introduction work, spoke on "Insect Parasitism and Biological Control." He said that the fundamental basis of biological control lies in the natural equilibrium which exists between all elements of the plant and animal world. The introduction of foreign plants into a country has been attended frequently by the introduction of injurious insects which, in the absence of their natural enemies in the new environment, have become serious pests. Since 1873 when a predaceous mite was sent from the

United States to France for the control of the grape phylloxera, an American insect, there has developed an astonishing international movement of the more specialized parasites and predators. An appreciable reduction has been effected in the case of at least fourteen others. While the majority of successful projects have occurred in Hawaii, Fiji and New Zealand, there have been classical successes in other lands and the search for parasites and predators now extends to the farthest corners of the earth.

The presiding officer at the St. Louis meeting was President C. H. Kennedy. Officers for 1936 are: *President*, H. B. Hungerford; *first vice-president*, J. A. Hyslop; *second vice-president*, T. H. Frison; *secretary-treasurer*, C. E. Mickel.

The program of the American Association of Economic Entomologists extended from Monday morning through Wednesday afternoon.

The opening day was given over to the programs of the three sections of plant quarantine, extension and apiculture. There was a joint meeting with the Entomological Society of America at noon on Monday for the annual address of President L. A. Strong of the association.

The general session of the association began with the business meeting on Tuesday morning, including brief reports from branch meetings and other entomological societies. The afternoon of Tuesday and Wednesday forenoon were given over to a program of volunteer papers on various phases of entomology. At the opening of each session an invitation paper was presented. The closing session of the association was featured by a symposium on orchard sanitation, under the direction of Dr. J. J. Davis, LaFayette, Indiana.

Approximately 80 papers were presented on the general program exclusive of the invitation papers and symposium.

Attendance at the various sessions totaled approximately 245, including members and visitors. Dr. L. S. McLaine, of Ottawa, Canada, was elected president.

The American Society of Parasitologists held its eleventh annual meeting on Tuesday, Wednesday and Thursday, under the presidency of Colonel Charles F. Craig. The program contained 63 titles; it extended over two and one-half days and consisted of papers on various aspects of parasitology, tropical medicine and public health. The program of the first day was made up of contributed papers in the fields of protozoology and helminthology. On Wednesday morning the society met jointly with the Sections on Zoological Sciences and on Medical Sciences. The program contained papers on trypanosomiasis, amebiasis, nematodes, ticks and relapsing fever. It was concluded by the presidential address of Colonel

Charles F. Craig on "Some Unsolved Problems in the Parasitology of Amebiasis." The parasitologists' luncheon was held on Wednesday at 12:30 and was followed by the annual business meeting of the society. Wednesday afternoon was devoted to the annual demonstration program of the society, and three of the histological laboratories at the Washington University Medical School were filled with demonstrations presented by members. The demonstration session is a special feature of the annual meeting and it is becoming of more and more significance each year. At the Thursday morning session the remaining papers on helminthology were read, together with papers on medical entomology and related subjects. At the beginning of 1935 the *Journal* was changed from a quarterly to a bi-monthly basis and the total number of pages increased from 376 to 470.

At the annual business meeting the following officers were elected for 1936: *President*, Robert W. Hegner; *vice-president*, William B. Herms; *members of the council* (to serve for four years), Asa C. Chandler and David H. Wenrich; *members of the editorial board* (to serve for four years), Elery R. Becker, Oliver R. McCoy and Richard P. Strong; *representatives of the society on the American Association Council*, George R. LaRue and Ernest C. Faust; *representatives of the society on the U. S. B. S. Council*, David H. Wenrich and George W. Hunter, III.

The Wilson Ornithological Club held its twenty-first annual meeting on December 30 and 31; some 38 papers were read covering every phase of ornithological activity. Physiological papers were given on the English sparrow and domestic pigeon by Dr. L. J. Cole and Dr. G. W. Woolley (University of Wisconsin), on the canary by Hurst Shoemaker (University of Chicago), on weaver finches by Dr. Emil Witschi (University of Iowa) and on the leg muscles of birds by Dr. George E. Hudson (University of Nebraska). Papers on bird protection and management were presented by Ira N. Gabrielson (chief, U. S. Biological Survey), by Roger T. Peterson (National Association of Audubon Societies) and by Irving Brant (Emergency Conservation Committee).

Food habits studies of hawks and owls were discussed by Dr. Paul J. Errington (Iowa State College), Walter J. Breckenridge (University of Minnesota), Fred M. Baumgartner (Cornell University) and W. M. Rosene, of Iowa. Life history studies were reported, of the coot by Professor George O. Hendrickson (Iowa State College), of the cowbird by Margaret M. Nice, and of the tree sparrow by Dr. A. M. Heydeweller (Cornell University). Ornithological education was treated by Roger T. Peterson (National Association of Audubon Societies) and Edith R. Force, of Oklahoma.

Illustrated faunistic papers were read, on the birds of the Bear River Marshes, southern Louisiana and Yellowstone, by Alfred M. Bailey (Chicago Academy of Sciences); on Rocky Mountain National Park, by A. E. Shirling (Kansas City Teachers College); on Tennessee, by Albert M. Ganier, and on the Churchill region of Hudson Bay, by Dr. A. M. Heydeweyler (Cornell University). Surveys and population studies were discussed by Margaret M. Nice, Professor Rudolph Bennett (University of Missouri), and Dr. Lawrence E. Hicks (Ohio State University).

Dr. J. Van Tyne (Michigan Museum of Zoology) reported on the significance of ornithological research collections and melanism in the Wilson snipe, and Dr. Myron H. Swenk (University of Nebraska) discussed hybridism in grosbeaks. H. M. Kennon, of the St. Louis Zoo, reported on unusual success in domestication of hummingbirds.

The meeting also included business sessions, exhibits, special entertainments, the annual dinner on Tuesday evening and field trips to Forest Park, the St. Louis Zoo, the Lagoons, the Jefferson Memorial, Tower Grove Park, the Educational Museum and the Missouri Botanical Garden.

SECTION ON BOTANICAL SCIENCES (G)

(Reports from S. F. Trelease, L. C. Petry, Paul Weatherwax, John M. Arthur, Robert E. Woodson, Jr., Howard P. Barss, W. F. Loehwing, Burton E. Livingston, H. M. Fitzpatrick, D. M. Moore, A. J. Sharp)

The Section on Botanical Sciences met in joint session with associated societies on Tuesday afternoon. More than three hundred botanists attended this unusually interesting session. Dr. B. O. Dodge delivered the retiring vice-presidential address for the section on the subject, "Reproduction and Inheritance in Ascomycetes." This address was followed by a symposium on "The Promise of Modern Botany for Human Welfare." Mr. Frederick D. Richey spoke on the botanist as a creator, Dr. E. C. Stakman discussed the botanist as a protector, and Dr. George T. Moore gave an address on the botanist as a cultivator.

The Botanical Society of America held its thirtieth annual meeting on Tuesday, Wednesday and Thursday. The reading of papers before the three sections occupied the forenoons and various joint sessions were held in the afternoons.

All meetings of the general section were well attended. The Tuesday morning program was centered around papers concerned with the methods of thickening of various types of cell walls. Other papers of this session dealt with other phases of plant anatomy and development. On Wednesday morning the program included papers on the dynamics of develop-

ment, cytology and genetics, cryptogamic morphology and gall formation. On Wednesday afternoon the general section met in joint session with the Ecological Society of America. The program of Thursday morning consisted of papers on growth and growth hormones, floristics, paleobotany and technique. On Thursday afternoon the general section met in joint session with the American Society of Naturalists and affiliated societies.

On Tuesday evening an informal round-table discussion of some problems of botanical teaching was held. As a result of this meeting a committee to arrange for further study of some of these problems has been authorized by the council of the society. Exhibits and demonstrations on display in Rebstock Hall during the afternoons attracted much attention from botanists.

The annual dinner for all botanists was held on Wednesday evening with a record attendance of 347. Dr. George T. Moore presided and presented Dr. Aven Nelson, president of the Botanical Society of America; Dr. A. F. Blakeslee, who spoke on plans for the *American Journal of Botany*; and Dr. E. J. Kraus, who gave the address as retiring president on the subject, "On Becoming a Botanist." At this meeting the election of the following officers of the Botanical Society was announced: *President*, C. Stuart Gager; *vice-president*, H. A. Gleason; *treasurer*, S. F. Trelease; *member of editorial board of American Journal of Botany*, C. E. Allen; *business manager of American Journal of Botany*, F. E. Denny. At the business meeting on Thursday morning, the resignation of Dr. Trelease as treasurer was announced and Dr. Denny was elected to take his place.

A total of 22 papers were read at three morning meetings of the physiological section. Papers on various radiation and electrical effects and on seed germination were given at the Tuesday morning session. The Wednesday morning meeting was devoted to discussions of the effect of auxins, growth substances and various chemical agents on the growth, rooting and other responses of plants. This was an especially interesting session because of the recent rapid developments in this particular field and the possibility that such study will eventually produce a more practical control of the production and growth of plant organs as well as a more fundamental understanding of the growth processes of plant cells. On Thursday morning papers on the following subjects were read: Effect of aldehydes on mosaic viruses; respiration of healthy and mosaic infected plants; criteria of sensitivity in Mimosa; oxidation potentials and the growth of fungi; rate of water flow and development of top and root of seedlings; tissue cultures and the distribution of ascorbic acid in plants. Abstracts of these papers appear in the December issue of the *American Journal*

of Botany. Probably the most outstanding papers as determined by the amount of discussion which followed were: Heinicke on the photosynthesis of an entire apple tree enclosed in a glass cage during the entire growing season; Levine on the response of plants when painted with carcinogenic agents of animals; La Rue on the effect of auxins, insect and animal feces on intumescences and cell outgrowth; and Zimmerman and Hitchcock on the rooting responses, bending responses and transport of growth substances. The latter described in detail the bending, proliferation and rooting responses of plants to 16 growth substances. While the type of response to each substance was the same, the concentration necessary to produce the response varied with the different substances.

At a business meeting of the section the following officers were elected for the coming year: A. J. Heinicke, *chairman*; H. C. Sampson, *vice-chairman*; O. F. Curtis, *elected*, and S. H. Eckerson, *ex-officio members of the Physiological Board*. Lewis Knudson was chosen as elector to select a representative to the National Research Council.

It appears significant that only a minority of the scheduled papers read before the systematics section were "purely" taxonomic in character and interest. Taxonomy is properly an end achieved only through the integration of other fields of biological endeavor. Highly stimulating, therefore, were the two symposia sponsored jointly by the systematics section of the Botanical Society of America and the Genetics Society of America on: "Contemporary Investigation of Taxonomic Concepts," and "Species from a Genetic Viewpoint," with B. M. Davis and L. J. Stadler as chairmen, and A. J. Eames, E. Anderson, E. B. Babcock, R. E. Cleland, Sewall Wright, Th. Dobzhansky and J. Clausen as speakers, representing the standpoints of anatomy, morphology, taxonomy, geographical distribution, cytology, genetics and biometry. Such meetings of biologists upon common ground may not soon result in an all-inclusive formula for taxonomic concepts, but the surely resulting spirit of understanding and cooperation should prove to be a most effective agent in the dissolution of biological provincialism.

The American Phytopathological Society held its twenty-seventh annual meeting from Tuesday to Friday inclusive with probably the largest attendance in its history; the total membership is now 832. G. H. Coons was elected *president*, Carl Hartley, *vice-president*, and Neil E. Stevens, *councilor*. The program of the annual dinner attended by 247 persons commemorated fittingly the completion of 25 years by the official journal *Phytopathology*. The scientific program consisted of 132 papers, divided among 14 sections. That 25 papers of unusual interest dealt with plant viruses is evidence of present activity in this field.

Joint sessions were held with the Section on Botanical Sciences, the Mycological Society of America, the Genetics Society of America and the Potato Association of America.

The address of the retiring president, H. T. Güssow, entitled "Plant Quarantine Legislation—A Review and a Reform," which penetratingly analyzed the problems of international plant protection and proposed measures looking to greater effectiveness with less disturbance of normal commercial relations, was ordered printed in *Phytopathology*. Special sessions, devoted to the coordination of research and extension work in plant pathology, to the problems of regulatory and control measures against foreign plant diseases and to effective plant disease survey procedures, were largely attended and resulted in definite constructive action. The Thursday evening symposium on "Antibiosis" proved highly interesting to some 160 who attended.

The society went on record as endorsing more effective coordination both among the plant pathologists and between the plant pathologists and workers in allied research fields. The establishment of coordinating committees in connection with work on potato diseases, cereal seed treatment and tobacco diseases was announced.

The American Society of Plant Physiologists held its eleventh annual meeting on Tuesday, Wednesday and Thursday. The society took part in joint sessions, as follows: (1) A session with the Section on Botanical Sciences at which was given the address of B. O. Dodge, of the New York Botanical Garden, who was retiring vice-president of the section, followed by a symposium on "Botany and Human Welfare." (2) A session with the American Society for Horticultural Science, at which were read contributions on photoperiodism, seasonal changes and cold hardiness. (3) A session with the Physiological Section of the Botanical Society of America, which was devoted to a symposium on light relations. On Tuesday evening the society held its annual dinner at which were delivered an address by Burton E. Livingston, of the Johns Hopkins University, retiring president, and the Stephen Hales Lecture by Charles A. Shull, of the University of Chicago, recipient of the society's Hales Prize for 1935. Also W. F. Loehwing, of Iowa State University, representative of the society at the Sixth International Botanical Congress, at Amsterdam, presented an interesting report on some features of that congress. An obituary of the late Professor F. C. F. W. Went, of Utrecht, who was a corresponding member of the society, was presented by F. M. Andrews, of Purdue University, in the unfortunate absence of its author, George C. Peirce, of Leland Stanford University. The obituary is to be published, with a portrait of Professor Went, in the society's journal, *Plant Physiology*. It was announced at the dinner that

three new corresponding members of the society had been named, in recognition of their many important contributions to the science of plant physiology. These are: N. A. Maximov, of Leningrad; Hans Molisch, of Vienna; and Bohumil Nemec, of Prague. Professor Livingston's retiring presidential address, entitled "A Science of Many Aspects," dealt with what he called obiter dicta, or readings between the lines. He emphasized especially the manifold relations of plant physiology to all other sciences and dwelt on the general cultural value of this science in addition to its well-recognized practical values. In Professor Shull's scholarly lecture, entitled "Atmospheric Humidity and Temperature in Relation to the Water System of Plant and Soil," he presented the fundamental water relations of plants in a new and original manner, showing how the moisture of soil, plant and air may be treated as a single dynamic system whose performance is controlled by pressure gradients that may be satisfactorily measured or computed. This was the first of the Hales Lectures, which are now to be given at two-year intervals, at annual meetings of the society. It will appear in *Plant Physiology*. The dinner was followed by a New Year's Eve entertainment, which lasted till after midnight. At the regular sessions for the reading of contributions 41 brief papers were presented, dealing with recent advances in almost all fields of this science. Authors' abstracts of these papers were distributed to all members prior to the meeting.

The Mycological Society of America held its fourth annual meeting on December 31 and January 1, with President B. O. Dodge in the chair. At the business meeting reports presented by the secretary-treasurer and managing editor of *Mycologia* showed the society and its journal to be in sound financial condition. Its membership is now in excess of 360 and increasing. New officers elected for 1936 are: H. M. Fitzpatrick, *president*; A. H. R. Buller, *vice-president*; D. H. Linder, *secretary-treasurer*; and B. O. Dodge, *councilor*. The council reelected F. A. Wolf to serve an additional five-year term as associate editor of *Mycologia*. The president discussed the importance of the summer forays, and reported on the pleasing and successful nature of that held at Ithaca, N. Y., last summer. Joint sessions were held with the American Phytopathological Society and with the Section on Botanical Sciences. President Dodge addressed the society on the subject of "Facultative and Obligate Heterothallism in Ascomycetes" and as the retiring vice-president of the Section on Botanical Sciences gave a paper on "Reproduction and Inheritance in Ascomycetes." Only sixteen papers were listed on the program of the society.

The American Fern Society met on Wednesday afternoon. Julian A. Steyermark (Missouri Botani-

cal Garden) reported on the "Ferns and Fern Allies of Missouri, with Special Reference to Their Geographical Distribution." Dwight M. Moore (University of Arkansas) spoke on "The Ferns and Fern Allies of Arkansas," referring to a new form of the goldie fern from north central Arkansas, the proliferation of *Ophioglossum engelmanni* and other new records for the state. "Notable Range Extensions of Ferns in Illinois" was discussed by Mary M. Steagall (Southern Illinois Teachers College).

The following papers were read at the Sullivant Moss Society meeting on Thursday afternoon: "A Bryological Excursion in Florida," by A. J. Grout (Manatee, Florida); "The British Bryological Foray at Killarney, August, 1935," by H. S. Conard (Grinnell College); "Further Notes on Some Pygmy Mosses," by F. W. Gray (Philippi, W. Va.); "Some Observations on the Liverwort, *Riella*," by R. A. Studhalter (Texas Technological College); "Bryophytes of Utah," by Seville Flowers (Carbon County High School, Price, Utah); "Notes on Interesting Bryophytes of the Southern Appalachians," by A. J. Sharp (University of Tennessee).

The officers for the biennium 1936-37 are: *President*, Dr. W. C. Steere (University of Michigan); *vice-president*, Dr. Winona H. Welch (DePauw University); *secretary-treasurer*, Mr. C. L. Porter (University of Washington).

PROGRAMS RELATED TO BOTH ZOOLOGICAL AND BOTANICAL SCIENCES (F AND G)

(Reports from A. M. Banta, A. G. Vestal, M. Demerec, J. E. Ackert, Paul A. Warren, Paul S. Welch).

The meeting of the American Society of Naturalists was notable. The Biologists' Smoker, sponsored jointly by the American Society of Naturalists and the association, was held on Tuesday evening at the Municipal Auditorium. This has become one of the notable affairs of convocation week. Approximately 600 were in attendance, many of whom remained until nearly midnight.

The largely attended round-table conference on "Species from the Genetic Standpoint" on Wednesday afternoon was arranged by the Naturalists in conjunction with other societies.

The Naturalists' symposium on Thursday afternoon brought together an audience of 250 or more, including men of science from widely different disciplines, to hear a program participated in by archeologists, geologists and paleontologists. The symposium subject, "Early Man in America, with Particular Reference to the Southwestern United States," was introduced by Dr. Edgar B. Howard's discussion of the association of human culture and remains of an extinct fauna in New Mexico. Dr. Chester Stock outlined the succes-

sion of mammalian forms within the period in which human remains are known to occur in America. Dr. Ernst Antevs treated the evidence of climatic change as related to the general subject under discussion. Dr. Paul MacClintock reviewed crucial evidence from the stratigraphy and physiography of certain critical areas. Dr. Frank H. Roberts discussed and illustrated artifacts of Folsom man; and Dr. E. H. Sellards closed this notable symposium with a brief review of the many significant findings of cultural artifacts, especially in Texas, together with their interpretation. While the evidence is not in all respects final, it seems convincingly to indicate that man lived in the southwestern United States much earlier than had previously been supposed.

The annual Naturalists' dinner held on Thursday evening was well attended. The distinguished president of the society, Dr. John C. Merriam, gave the presidential address on the subject, "The Extent and Rate of Human Evolution—the Asking of Critical Questions." This noteworthy address closed the Naturalists' program with a critical summary of the evidence of man's early existence in America, probably 10,000 or 20,000 years ago, at a period much earlier than had been recognized until very recently. The papers of the symposium will be published in *The American Naturalist* and the president's address in *The Scientific Monthly*.

The twenty-first annual meeting of the Ecological Society of America began with the Tuesday morning session. In the first paper, Professor B. E. Livingston (with D. B. Lawrence and W. L. Norem) described adaptation of self-starting electric clocks to ecological instruments for summation of periods when foliage is wet and for integrating environmental heat supply. Walter Kiener presented an arrangement of the alpine vegetation of Long's Peak recognizing three altitudinal subzones, the lowest with nine associations. The numerous plant communities of peninsular Florida and their relations to soil and water-level were outlined by John H. Davis, Jr. Some very peculiar soil profiles with great contrast in pH were noted. C. H. Mueller emphasized the value of vegetation as the indicator of climate, where meteorological stations are few or absent, as in mountains of northeastern Mexico. T. D. Mallery gave results of numerous rainfall measurements in the Sonoran desert. Proportions of winter and summer rainfall differ greatly in the various stations. Changes in the different components of mixed vegetation near Boulder, Colorado, over a period of years were traced by A. G. Vestal. No general trend could have been predicted. The study by W. T. Penfound and E. S. Hathaway of marshes of southeastern Louisiana showed the dependence of the numerous communities upon standing water-level in relation to soil surface and upon salt

content of soil or water. S. A. Cain presented a new plan for organization of the herbarium of the Cold Spring Harbor Laboratory, based on the synusia or detailed vegetation-units. Charles A. Hursh summarized economic studies of correlations between soil-impoverishment and degree of erosion and old-field primary vegetation in the southeastern states.

Tuesday afternoon was devoted to a symposium of invited papers on ecological aspects of some recent activities of the Federal Government. After the introduction by the chairman, Dr. Herbert C. Hanson, Dr. John M. Aikman told of the ecological basis of the shelterbelt project and of new research necessary for its development. Particular attention was directed to native forest communities and the possibility of their establishment on uplands. Ira N. Gabrielson, chief, U. S. Biological Survey, showed that most branches of the survey's work have been based on ecological knowledge and research. He sketched some present problems and activities of the survey. Dr. A. G. Chapman emphasized, as part of research programs of the Forest Service, problems in reforesting submarginal lands. Dr. Charles T. Vorhies talked of wild-life aspects of range rehabilitation, particularly in the southwest. Drastic and immediate reforms are necessary, but their achievement is not likely. Dr. W. E. McQuilkin outlined problems of the Division of Land Utilization of the Resettlement Administration. Withdrawal from cultivation of areas not suited to crop production, alternative uses and reestablishment of grass cover in parts of the Great Plains were stressed. Robert Marshall (Office of Indian Affairs) gave an interesting history of interplay between environments, white men and the Indians. Present efforts to correct much of the progressive injury to the Indians' lands are aided by an ecological background. Discussion of the papers was led by Dr. V. E. Shelford.

The annual dinner for all ecologists, on Tuesday evening, was well attended. At its close Dr. Walter P. Taylor, president of the society, gave his address, "Ecology: What Is It, and What Good Is It?" He sketched a greatly enlarged usefulness of ecological knowledge and activities. The address was followed by moving pictures in natural color made the past summer at Glacier Bay, Alaska, by Dr. W. S. Cooper. The ice-falls at glacier fronts were remarkably well shown.

On Wednesday morning there was a joint session of the Section on Zoological Sciences with the Ecological Society. Dr. L. D. Wooster showed the effects of drouth on animal populations in western Kansas, especially of jack-rabbits, meadow-mice and hawks. Dr. A. M. Holmquist reported studies on local distribution of the mounds of the ant *Formica ulkei*. Professor E. D. Ball repudiated the suggestion that

"rodents constitute the greatest active check with which grasshoppers have to contend." Quite other factors in grasshopper control were emphasized. Dr. W. C. Van Deventer described a winter bird community in western New York. Dr. Orlando Park reported further studies in nocturnal ecology: an account of class excursions for field study at night (with H. F. Strohecker); and a new recording apparatus for studying activity rhythms of insects. Roy E. Campbell gave results of experiments on temperature and moisture preferences of wire-worms. F. B. Isely reported on extensive studies of acridian distribution, numbers, seasonal and soil relations in northeastern Texas. H. M. Hefley described seasonal societies of birds and mammals in floodplains of the South Canadian River in Oklahoma.

The general section of the Botanical Society met with the Ecological Society on Wednesday afternoon. H. C. Hanson showed correlations of grassland types with soil types in badlands of western North Dakota, as found by himself and Warren Whitman. Dr. Frank C. Gates described the numerous and unexpected changes in vegetation over a twelve-year period in and about an artificial lake at Manhattan, Kansas. Dr. Henry S. Conard told of the sessions and excursions of the geobotanical section of the Sixth Botanical Congress at Amsterdam last September. Professor Francis Ramaley's paper on the sand-hill districts of northeastern Colorado emphasized the successions, culminating in the *Andropogon-Calamovilfa* consociation. The extensive botanical survey by the Carnegie Museum of the Uinta Basin reveals its distinct character as well as its derivatives, as was shown by Dr. Edward H. Graham. Two papers by Drs. Charlotte L. Grant and A. G. Vestal emphasized adequate physical study of moisture-properties of the soils as prerequisite to a new moisture-control method for plant cultures. Dr. Lewis M. Turner demonstrated the various rôles of shortleaf pine in forest succession in Arkansas. There has been a tendency to regard site and successional relations of important tree species in simple and too limited a fashion. Dr. L. J. Pessin gave an account of competition of ground cover with longleaf pine seedlings. Professor W. S. Cooper's fourth expedition to Glacier Bay in 1935 was illustrated by charts showing vegetation changes since 1916.

The Thursday morning session was devoted to forest ecology. R. M. Harper called attention to the buoyant character of acorns of *Quercus lyrata*, frequently subjected to flooding. W. T. Penfound and A. G. Watkins described phytosociological studies in the last virgin pine timber in southeastern Louisiana. J. M. Aikman and A. W. Smelser reported detailed studies on woodland communities bordering streams in cen-

tral Iowa. Dr. Stanley A. Cain enumerated forest alliances and associations of the cove hardwoods of the Great Smoky Mountains. A. J. Sharp and Dr. Cain described bryophyte communities of certain forest types in the same mountains. Dr. E. Lucy Braun showed that the really primeval or *primary* forest stands in eastern Kentucky are mesic mixtures of many tree species, with highly variable composition. Association-segregates (each with few species) are numerous, more so at greater distances. W. E. McQuilkin's study of pitch-pine roots and their mycorrhizae below ground-water level calls for revision of current ideas on intolerance of waterlogging by tree roots.

At the business session officers for 1936 were elected as follows: W. S. Cooper, *president*; J. G. Needham, *vice-president*; Orlando Park (Northwestern University), *secretary-treasurer*.

The Thursday afternoon program was varied. Problems of wind-erosion in the southern Great Plains and its prevention or correction through anchorage of soil by short-grass cover were discussed by Dr. Paul B. Sears. The five small remaining groves in Syria of the Cedar of Lebanon were described by Robert M. Warner. John Voss gave results and conclusions from a pollen analysis of bogs in Late and Early Wisconsin drift in Illinois. Dr. Edith A. Roberts reported on water relations of mosses, based on microchemical studies. B. D. Barclay and Harriet G. Barclay's studies at different altitudes in the Rocky Mountains dealt with organography of *Elephantella* and alpine meadow successions. Two papers on root systems of economic plants were presented. T. K. Pavlychenko's new method of extricating entire root systems of crop plants and of their weed competitors was regarded by his auditors as of high value. W. W. Yocum worked on roots of young apple trees competing with corn in interplanted rows, with three different spacings.

The Genetics Society of America tried a radical modification of its usual program by eliminating short papers and substituting for them demonstration papers. At the Tuesday morning session sixteen demonstrations were held simultaneously, all dealing with botanical problems. A large laboratory room was used for this purpose. Each author had an assigned space, where he was ready to discuss the problem of his paper with the aid of demonstrations varying from a simple chart representing the summary of data to demonstrations of microscopic objects and of living material. Among those demonstrating, L. J. Stadler and G. F. Sprague showed the results of experiments on treatment of maize pollen with ultraviolet radiation, indicating that wave-lengths longer than 300 millimicrons are ineffective in producing genetic changes; E. J. Willhausen showed that viru-

lence of *Bacterium stewartii* was decreased when passed through resistant strain of maize and increased when passed through a susceptible strain; the demonstration of S. Satina and A. F. Blakeslee indicated that in triploid *Daturas* a considerable reduction in chromosome number occurs before the formation of the egg cell; the problem of size difference in Cucurbits was elaborated by E. W. Sinnott and also by L. M. Weetman. In the afternoon a similar demonstration session was held for papers dealing with the zoological material. At this session demonstrations dealing with cytogenetic analysis of *Drosophila* through salivary chromosomes played a prominent part; also G. W. Beadle and B. Ephrussi showed the results of transplantation experiments with *Drosophila*; C. H. Danforth showed the effect transplantation had on plumage of pheasants; J. S. Potter, E. C. MacDowell and M. J. Taylor showed the effect of inoculation of tissues of various strains of mice on the resistance to leukemia.

The Wednesday afternoon session was taken up by a round-table conference on "Species from a Genetic Standpoint" and the Thursday forenoon session with another conference on "Genetics and Plant Breeding." Each conference was in charge of a leader and the subject was introduced by short presentations of three introducers, after which followed a general discussion. In spite of large numbers (over 200) present at these conferences the discussion was lively and proceeded without any difficulties.

Both parts of this year's experimental program, the demonstrations and the round-table conferences, were so well received by the members attending the meeting that the society expects to continue a similar type of program at the next meeting.

The newly organized Limnological Society of America held its first annual meeting on Thursday afternoon. A scientific program, consisting of eighteen papers, was presented. In addition, the program carried twelve papers read by title. The papers read dealt with various limnological investigations such as: the high altitude lakes of Indian Tibet; distribution of certain minerals in lakes; sedimentation; penetration of light into inland waters; fish foods; bottom faunas of lakes and streams; repopulation of streams after erosion; life cycles and growth rates of aquatic insects; distribution of freshwater sponges; and limnological instruments and methods. At the close of the scientific program, the annual business meeting was held. The following officers were elected for 1936: *President*, Professor Chancey Juday; *vice-president*, Professor R. E. Coker; *secretary-treasurer*, Professor Paul S. Welch; *elective members of the executive committee*, Professor L. H. Tiffany (one year), Professor L. P. Schultz (2

years), and Professor W. J. K. Harkness (3 years). The society is beginning with a charter membership of 221.

The American Microscopical Society held its fifty-fourth annual meeting on Wednesday. The following officers were elected for 1936: *President*, Professor H. W. Stunkard; *first vice-president*, Professor C. W. Dodge; *second vice-president*, Professor H. E. Jordan; *elective members of executive committee*: Dr. L. O. Nolf (3 years) and Dr. Harold Kirby (2 years). J. E. Ackert and A. M. Chickering were named to represent the society in the council of the American Association. The society is continuing its cooperation with *Biological Abstracts* in 1936.

The Phi Sigma Society held two sessions for the transaction of business and four sessions for the presentation of papers by junior research workers. Eighty-nine papers were listed on the program. Re-elected to office for the ensuing four years were Dr. M. H. Hatch, *vice chancellor*, and Dr. A. I. Ortengraber, *secretary*.

SECTION ON ANTHROPOLOGY (H)

(Report from Wilton Marion Krogman)

This section held its meetings on January 2 to 4. The first session was devoted to a consideration of the morphology of American Whites and American Negroes. R. J. Terry reported that in 83 per cent. of whites and 86 per cent. of Negroes, the *M. peroneus tertius* was inserted on metatarsals IV and V. G. A. Seib, in a discussion of the insertion of the *M. pectoralis minor*, found no race differences, but there appeared to be a statistically significant sex difference in both groups. In a report on the reconstruction of nasal cartilages from the skull, G. D. Williams found that it was possible to predict the location of cartilages from the bony landmark alone. Mildred Trotter stated that accessory sacro-iliac articulations were found in males of both groups. W. W. Graves discussed the biological significance of inherited variations, observing two basic scapular types, convex and scaphoid, the former possessing survival value, the latter less fit. T. H. Evans (Long Island College of Medicine) outlined his comparative study of evolutionary trends in hand and foot, concluding that in man there is discernible a definite trend toward even more perfect adaptation to terrestrial progression.

The second session took up problems of American archeology. J. D. Jennings stated the following sequence for Fulton County, Illinois: Black Sand, Red Ochre, Hopewell (variant), Woodland, Mississippian, Late Woodland. This general chronology was substantiated in a detailed analysis prepared by Thorne Deuel. P. F. Titterton reported from Jersey County, Illinois, three definite cultures: Ca-

hokia, Hopewell (variant), "Bluff Mounds." His conclusions were illustrated by an exhibit of cultural and skeletal material. G. A. Black discussed the Nowlin Mound of Indiana and concluded it to be of the Adena (Ohio) culture. E. H. Bell, on the basis of an analysis of the archeology of Nebraska, postulated a new cultural phase; Central Plains, as distinct from Upper Mississippi. Horace Miner discussed the Kincaid Mounds of Illinois and their relation to the Illinois cultural complex. F. M. Brown offered a possible concordance between the Morley and Goodman-Teeple systems for decoding Mayan dates, suggesting a date of calendrical connection of time between the Tuxtla Statuette and the Leyden Plate. Morris Steggerda, in a study of dental condition of modern Maya, Navajo and Whites (Dutch), emphasized the relative freedom from dental caries of the Indian groups.

The third session was devoted to American archeology and ethnology. P. A. Brannon reported on Tallapoosa (Alabama) cultural evidences, with special reference to the central position of the urn-burial cultures. W. S. Webb submitted a preliminary outline of the archeological work in Norris Basin (Tennessee) under the TVA; twenty-four sites were reported on and house-types were discussed. In connection with his work in Kentucky, Professor Webb offered observations on prehistoric textiles, considering form of textiles, their occurrence, preservation and types of weaves. E. B. Renaud reported on artifacts from southwestern Wyoming, discussing the possibility of type and time relation to European Paleoliths. H. H. Turney-High outlined Flathead Indian (Montana) economic life on the basis of the food complex, slavery, wealth concepts and exchange and distribution. Frances Densmore presented her views on methods of recording Indian songs, concluding that the most permanent method of preserving these songs is by means of sound-on-film records made in the field and transferred to disks in a laboratory.

On Friday evening M. J. Herskovits gave the address of the retiring vice-president on "Applied Anthropology and the American Anthropologist." The paper will be published in *SCIENCE*.

An exhibit of anthropological methods which had been arranged by Dr. R. J. Terry, his staff and associates, in the Anatomical Laboratory of the School of Medicine, St. Louis University, proved of great interest.

SECTION ON PSYCHOLOGY (I)

(Report from John A. McGeoch)

The sessions of the section were held from Monday to Wednesday. The large number of abstracts submitted for the program this year made it desirable to hold two parallel sessions on Monday morning and

afternoon and on Wednesday morning. The first session on Monday was devoted to papers on physiological and comparative psychology. E. Jacobson reported evidence, on the ground of action-potentials from within the brain of a human subject, for a specific center involved in normal jaw closure. K. M. Dallenbach presented data which render the summation theory of pain untenable and which show pain to be a separate modality of experience which may be completely adapted without undergoing qualitative change. It was found by W. R. Miles that intraperitoneal injections of caffeine alkaloid interfered with the smooth and continuous functioning of a well-learned habit but did not increase errors. Ethyl alcohol, on the other hand, greatly increased both errors and time. C. Murchison presented data upon the social behavior of *Gallus domesticus*, together with equations of the time functions in the formation of social hierarchies of different sizes, and a lack of specificity of response in the manner in which the mother rat carries her young was observed by R. H. Waters and D. Causey. A comprehensive measure of male sex drive in terms of six agreeing criteria was described by R. Ledgerwood. A. F. Blakeslee and M. C. Hrubetz reported the taste thresholds for 14 substances.

A parallel session on Monday morning was devoted mainly to mental measurement. From an analysis of speed and power tests, I. Lorge concluded that the commonly reported mental decline with age has been greatly exaggerated. F. L. Ruch described a new test of suggestibility-negativism which has a high reliability and which is unrelated to intelligence and to several other important variables. H. M. Johnson gave a critical analysis of attempts to measure attitudes and concluded that the usual procedures are invalid. H. Woodrow applied to a large amount of data two quite different methods of measuring difficulty and summarized the results. Gastric activity is not in newborn infants an excitant to bodily activity, according to the work of T. W. Richards. Correlations between age and productivity in various types of literature were discussed by J. B. Heidler and H. C. Lehman.

Eight papers on the psychology of learning were read at one of the parallel sessions on Monday afternoon. G. D. Higginson reported the influence of maze rotation upon human learning and related the data to other problems. A. W. Melton and J. McQ. Irwin found a proactive inhibition of interpolated by original learning, but this inhibition had disappeared by the fifth trial. Retroactive inhibition was greatest in terms of relearning when 10 interpolated trials were given and in terms of recall when 20 interpolated trials were given. Theories of retroactive inhibition were discussed by S. H. Britt, who defended an elabo-

ration of Webb's transfer-disruption hypothesis. Proceeding from his experimental data on remote association, H. N. Peters criticized the existing concepts of remote association and presented a restatement of the problem which removed the contradiction between prior results. C. L. Hull reported an experiment designed to determine whether certain phenomena of animal learning can be explained on the basis of excitatory tendencies alone. The results make it necessary to assume both excitatory and inhibitory tendencies. On the basis of the outcome of learning, C. N. Rexroad found that seven types could be differentiated. The functions of conditioning and active trial and error in producing these outcomes were analyzed. H. Syz described a case of recovery from post-traumatic loss of reproductive memory after treatment with hypnosis and analytic methods and M. E. Bunch presented results upon amount of transfer as a function of time-interval.

At the other Monday afternoon session H. H. Remmers gave a summary and critique of the work on test reliability and presented results obtained by two operationally defined measures. T. V. Moore discussed the reduction in product-moment correlation when the product-moment formula is used with data showing curvilinear regression and gave a method for modifying the measuring scale so that the product-moment formula may always be used. F. McKinney presented an empirical method for analyzing and testing the various items in a sales interview, and J. Zubin described an objective scale for measuring bilingualism. M. M. Roos reported an application of sampling theory to Federal Emergency Relief and to White House mail during 1933-1934 and discussed some of the psychological trends discovered. Scores made in successive five-minute periods of work at an equation completion test show increasing reliability but no corresponding increase in correlation with college grades, according to J. C. Peterson.

It has for some time been the custom to hold a joint symposium of the Sections on Psychology and on Education upon a problem of interest to members of both sections. The topic of this year's symposium, held on Tuesday morning, was "Maturation and Learning." This report is given by the Section on Education.

On Tuesday, at a luncheon meeting of the Sections on Psychology and on Education, W. R. Miles presented a well-chosen appreciation of Joseph Peterson, deceased vice-president of the Section on Psychology (1935-1936), as a psychologist and a teacher. J. E. Anderson, retiring vice-president of the section, read an address on "Child Development and the Interpretation of Behavior," the thesis of which was that specificity of behavior is a result of external environmental demand rather than of internal factors. With

development goes differentiation of the stimulus field in parallel with specificity of response. Parallel with differentiation goes also integration through experience. The differences between learned and inherited responses are relative rather than absolute. G. T. Buswell, retiring vice-president of the Section on Education, read an address on "The Contribution of the Study of Eye Movements to the Psychology of Perception." He surveyed the methods and results of studies in reading and in looking at pictures, and reported particularly recent work of his own on eye movements in looking at pictures, the results of which are in striking contradiction to many of the customary notions concerning the relation between the structure of the picture and the eye movements stimulated thereby. The address was richly illustrated with slides.

Four theoretical papers were read at a session late Tuesday afternoon. R. H. Wheeler discussed the methodology of psychology and presented a review of what he considered the most fruitful general methods. L. B. Hoisington dealt with a definition of the field of psychology which will delimit it from other sciences, determine the fields to which it should contribute and determine the divisions of the total field. The social psychology of Pareto was summarized by P. F. Finner, and A. Korzybski defended general semantics as a natural science and developed its implications for psychology.

One of the Wednesday morning sessions was devoted to papers on emotion and abnormal psychology. Associations between melodic phrases and words denoting feeling states were reported by W. B. Shimp. C. A. Ruckmick argued for the validity of the concept of emotion, pointed out the necessity for a standardization of definition and developed a phylogenetic theory which has both psychological and physiological aspects. By means of moving pictures, C. Landis and W. A. Hunt have analyzed the overt behavior pattern of startle and have found it to be both a complicated and rapid response. It appears and disappears in less than one-half second. E. S. Cowles developed a new approach to the pathology and treatment of the psychoneuroses and to the melancholia-mania psychosis in which the organism is considered both as a physical and a mental mechanism. M. N. Chappell, F. H. Pike and L. A. Johnson reported a follow-up study of 32 experimental subjects who had had peptic ulcer and who had been treated by psychological procedures as well as by the standard medical ones. There had been recurrences, but in general the psychological procedures had proved to be effective. The relations between early abnormal symptoms and adult psychoses, as indicated by 52 case histories of functional psychotics, were described by A. S. Edwards and L. D. Langley.

In the second session on Wednesday afternoon, concerned with educational psychology, H. J. Peterson presented evidence showing the positive value of automatic guidance in learning, and H. B. Reed reported that college courses decreased the variability of achievement. J. P. Porter described a cooperative study of the relative difficulty of psychology as a college subject, and M. B. Jensen and M. Schrodtt showed that what a child learns in a five-minute study period is dependent, though not entirely, on difficulty of vocabulary and degree of comprehension. Organization and method of presentation are also determining conditions. The striking differences and similarities in intelligence and adjustment in a family of eleven adults were abstracted by D. A. Worcester. Study habits considered symptomatic of good scholarship at college levels may not be indicative of high achievement at lower levels, according to N. B. Cuff. N. L. Hoopingarner discussed the importance of psychological training as a foundation for business and the professions.

SECTION ON SOCIAL AND ECONOMIC SCIENCES (K)

*(Reports from James Ford, Forrest M. Danson,
Howard Richards)*

The program for this section was planned primarily for specialists in economic and social ecology. With only one or two exceptions each paper summarized the findings of many years of research covering both methodology and findings. At the first session on Tuesday Professor Stuart A. Queen (Washington University) outlined the cooperative studies recently made or in progress in St. Louis, and was followed by Carl M. Rosenquist (University of Texas) on urbanization in Texas.

On Wednesday, Carl Birkey discussed the studies directed by Professor E. T. Hiller of the University of Illinois on regional types and trends, a study of ecological organization of the mid-west population covering 52 urban centers in five states, classified by size of community. Professor T. Earl Sullenger (Municipal University of Omaha) presented a study of ethnic assimilation in Omaha, illustrated by spot maps.

With striking objectivity, Dr. Fred S. Hall, for five years editor of the Social Work Year Book, covered the trends of the decade in social work and related fields. This was followed on Thursday by Professor Leah Feder's paper on the trend of relief administration during the last half century, revealing the little use which had been made in each depression period of the funded experience of preceding depressions.

A study of the influence of the AAA cotton program upon the tenant cropper and laborer, conducted by Dean Fred C. Frey and Professor T. Lynn Smith,

revealed the tendency of the government program to force the agricultural laborer out of the cotton fields onto public relief, while reducing the freedom of movement of the cropper and tying him to the plantation upon which he dwelt at the time of the inauguration of the program.

A paper by Ferris F. Laune (sociologist of the Division of Pardons and Paroles at Illinois State Penitentiary, Joliet) dealt with the application of attitude tests in the field of parole prediction. A lengthy questionnaire has been administered during the past two years to over 600 inmates of the Joliet Penitentiary, as over 90 per cent. of persons now in prison will be released through process of law at some time. The following up of this method, before and after parole, should in time give quantitative tests of the tendency to recidivate.

Dr. Carl Snyder, retiring vice-president, was unable because of illness to attend the sessions and present his paper on "The Rôle of Capitalism in Civilization."

On Thursday morning the Econometric Society joined with the American Mathematical Society and the Institute of Mathematical Statisticians, the program being devoted to mathematical economics and statistics. In the main address Dr. Thomas H. Rawles (Colorado College) pointed out mathematical difficulties associated with the construction of index numbers. In particular, he showed that index numbers may falsely represent situations as a result of integrations not being independent of the path. He showed further that various index numbers now in use assume existence of homogenous price and quantity relationships which seldom exist in practice. Finally, he indicated the hopelessness of attempting to measure utility and in addition suggested several ways for minimizing errors arising from the use of index numbers.

At the following session Dr. Joseph Mayer criticized several fundamental economic concepts and suggested several new hypotheses which were indicated. At the same session Professor H. H. Germond (University of Florida) examined population doctrines of Malthus, Pearl, Reed and others, and showed how each was a special case of a more general theory. Professor Harold T. Davis (Indiana University) demonstrated statistically the existence of a 40-month cycle in stock prices from 1836 to the present and a 60-month cycle during much of the same period.

On Friday morning Alfred Cowles 3rd (Cowles Commission for Research in Economics) presented a multiple correlaton of .55 between bank deposits leading stock market prices by 9 months and dollar value of new building simultaneous with stock prices for the period 1886 to 1935. He explained that bank deposits represent volume of money and building the rate of investment, the latter a velocity factor. He pointed

out that the bank deposit series showed a 40-month cycle, previously reported by Professor Davis to exist in the stock market, and that the high correlation found between bank deposits and security prices was not, therefore, surprising. In discussion, Dr. William H. Newman said that building exhibited a 60-month cycle which Professor Davis had also found in the stock market. At the same meeting Dr. Spurgeon Bell (Home Owners Loan Corporation) reported on activities of the Federal Government in taking over mortgage loans and thereby replenishing working capital of building and loan associations and insurance companies.

At the concluding session on Friday afternoon, Mr. Roy Wenzlick (Real Estate Analysts, Inc.) discussed the relation of farm to urban values, pointing out that the general movements were similar but out of phase. At the same session Dr. Charles F. Roos (Cowles Commission for Research in Economics) combined rent, occupancy, taxes, replacement costs, foreclosures and building need (a quantity calculated from the number of families) into a formula correlating .93 with actual new building over a period of forty years. He said that the quantity, $\text{rent} \times \text{occupancy} = \text{taxes}$, represented a base value of property which was modified by a factor largely representing a psychological discount variable and involving foreclosure rates. He explained further that builders compared this composite value factor with construction cost and actually began construction when the ratio was sufficiently favorable, that is, when it was about 8 per cent. He also used the foreclosure rate to measure the availability of loans, a factor which modified action. In the final paper Dr. William H. Newman (James O. McKinsey Company, Chicago) showed simple correlations between various quantities influencing residential building-population waves, psychological attitudes, cost and other factors. His approach, while different from that of Dr. Roos, led to similar conclusions.

The fifteenth annual meeting of the Metric Association held on December 30 marked decided progress in the general use of meters, liters and grams. The objective was to increase the use of metric weights and measures, made legal for all transactions in the United States in 1866. When the metric car, driven by H. A. Richards, carrying a metric exhibit, kilogram scale and the secretary, passed westward over the Mississippi and stopped at the hotel, 1,510 kilometers had been rolled from the office in Pottsville, Pennsylvania. The scale was set up near the hotel desk and many guests were pleased to weigh themselves in kilograms. Representatives of the Wagner Electric Corporation, the Century Electric Company, the Mallinckrodt Chemical Works and others explained their use of

the metric system and the problems of coming to the complete use. J. T. Johnson of Chicago reported on the improved and simplified method of teaching metrics in Illinois.

The following officers were elected for 1936: *President*, J. T. Johnson (Chicago); *first vice-president*, Theodore H. Miller (Poughkeepsie, N. Y.); *second vice-president*, William R. Work (Pittsburgh); *treasurer*, James M. Martin; *secretary*, Howard Richards (Pottsville, Pa.).

SECTION ON HISTORICAL AND PHILOLOGICAL SCIENCES (L)

(*Reports from Joseph Mayer, Frederick Brasch, Emily Benjamin*)

The Section on Historical and Philological Sciences met jointly with the History of Science Society and the Academy of Science of St. Louis on Thursday and Friday. The number of members attending the sessions and the interest exhibited were highly gratifying. A great deal of excellent discussion was evoked.

The first session, covering a symposium on "The Study and Teaching of the History of Science," was led by Dr. George Sarton and dealt with the history of science as a principal guide to teaching. Interesting papers were presented by Professors H. T. Davis, L. C. Karpinski, U. G. Mitchell and R. S. Woodbury, bringing out among other things the following important facts: that the generalizations of science often lose their significance when divorced from historical origins; that the teacher is helped to understand certain technical difficulties in the presentation of his subject if he can hold in mind the development of the sciences from the simpler to the more complicated; that there seems to be a decided advantage in treating the history of arithmetic and algebra in a single course and the history of geometry and trigonometry in another course; that, as applied to engineering, the history of science gives background and depth, serves as a bridge to other cultural subjects, overcomes the repugnance of engineering students for history and cultural subjects in general, leads them naturally into an interest in philosophy, intellectual history and social problems, and aids in preventing the development of mere technicians.

The Thursday afternoon session continued in a general way the subject of the morning session. With respect to cooperative courses in the history of science, certain advantages were outlined; namely, that such courses provide a flexible medium of instruction which can be expanded as circumstances warrant, that they offer a considerable attraction for students in that men of scientific authority take part in them, that a richness of material is insured through the wide range of backgrounds drawn upon, and that a greater

understanding if afforded both on the part of lecturers and students with respect to the unity of science and its place in the history of civilization. At 4:30 that afternoon the retiring vice-presidential address was given by Dr. Solon J. Buck. This described the National Archives of the United States and the measures recently taken to provide proper housing for them in Washington. Interesting sidelights were also thrown upon the problem of further care of archival materials and upon photographic methods of reducing their bulk.

The Friday sessions were devoted to papers on early science in and around St. Louis, centering principally upon the Western Academy of Sciences, founded in 1837. Dr. C. A. Browne, in the opening address, showed that scientific research began in the Midwest as far back as 1824, with a group of colonists of communistic leanings who settled in the town of New Harmony, Indiana. The leader of this group was Robert Owens of England, who, with the help of William Maclure of Scotland, and Thomas Say of Philadelphia, established the earliest scientific research laboratories in that part of the country. The speakers who followed Dr. Browne reviewed the activities of the men most responsible for the development of science in the St. Louis area. Frederick Adolphus Wixlizenus, who emigrated from Germany in 1839, was particularly interested in botany and meteorology and apparently organized the first college of medicine in that section. William Chauvenet, a pioneer mathematician and astronomer, born in Philadelphia of French stock, came in 1855 to St. Louis to occupy the chair of mathematics at the newly established St. Louis University, of which he finally became chancellor. James Blake, born in 1815, was another of these pioneers, being among the first to employ experiments with the spectroscope to test chemical elements found in the human system. William Beaumont, a distinguished physiologist born in Connecticut in 1785, after an apprenticeship as country doctor and as a surgeon in the United States Army, took up private practice as a physician in St. Louis and became famous for his observations and studies with respect to gastric juices and the general physiology of digestion. Thomas Nuttall, a distinguished early botanist and ornithologist, carried on scientific explorations throughout midwestern United States and made a large collection of flora, including many unknown species. Benjamin F. Shumard, born in 1820, was described as a medical man who later became interested in geology and who, after settling in St. Louis, occupied the position of state geologist of Missouri, in which position he exerted an important influence upon scientific development in that state.

Besides reviewing the achievements of these promi-

nent early scientists in the St. Louis area, the Friday sessions dealt also with the history of the Academy of Science of St. Louis, an outgrowth of the Western Academy of Sciences. Beginning with a museum, library and botanical garden in 1856, this academy has since become a considerable influence in developing the fields of botany, zoology, mineralogy and especially paleontology in the Middle West.

SECTION ON ENGINEERING (M)

(Report from Vannevar Bush)

"Shall the Engineering Profession Formulate a Philosophy of Social Welfare?" was the subject for presentation at the meeting of the Section on Engineering on Friday evening. The speakers at this gathering, which was attended by about 250 persons, were Dr. Karl T. Compton (president of the Massachusetts Institute of Technology), General Robert I. Rees (assistant vice-president of the American Telephone and Telegraph Company) and Dr. C. F. Hirshfeld (director of research for the Detroit Edison Company).

In approaching this subject Dr. Compton reviewed the trend in recent years toward more general requirements for the licensing of engineers. He pointed out the position which the Engineers Council for Professional Development occupies in the enhancement of the status of the engineering profession and he mentioned particularly the work of the Committee on Engineering Schools of this council and its program for the accrediting of engineering schools throughout the country. General Rees approached the question from a different angle and described the methods and objectives of the Committee on Professional Training of the Engineers Council for Professional Development. This committee, under the chairmanship of General Rees, has developed a comprehensive program for stimulating and guiding the young engineer. The work of this committee has an important place in the formulation of the social and economic philosophy of the young engineer. Dr. Hirshfeld, chairman of the Engineers Council for Professional Development at the time of its organization as a cooperative enterprise of the principal national engineering societies, the Society for the Promotion of Engineering Education and the National Council of State Boards of Engineering Examiners, approached the subject of the evening's discussion on a more general basis and analyzed the issues involved and implied in the affirmative answer of the question of the evening.

The address of the retiring vice-president was presented by title only because of the unavoidable absence of Dr. Charles E. Skinner, the retiring vice-president and chairman of the section. The title of

Dr. Skinner's address was "Civilization's Debt to the Engineer."

The arrangements for this meeting were carried out by Dean A. S. Langsdorf as chairman of the local committee of the section. The meeting, through the courtesy of the Engineers' Club of St. Louis, was held in their Club House and was opened by Mr. E. O. Sweetser, president of the club.

SECTION ON MEDICAL SCIENCES (N)

(*Reports from Vincent du Vigneaud, William J. Gies, John C. Krantz, Jr.*)

The meetings of the section were unusually well attended, particularly the symposia on "The Sex Hormones," which were held on the mornings of January 2 and January 3. At these symposia, various phases of the chemistry and the physiology of these hormones were discussed.

The session on the morning of January 2 was devoted to the female sex hormones. The meeting was opened with a discussion by Professor E. A. Doisy (St. Louis University) of the isolation and chemical nature of the natural oestrogenic substances. After reviewing the work that led to the isolation of theelin and theelol, Professor Doisy discussed the proof of structure of these compounds and the isolation of the true follicular hormone, the dihydrotheelin. A paper by Dr. G. F. Marrion took up the question of the identity of the combined oestrogenic material excreted during pregnancy and its physiological significance. It has been a difficult thing to understand how such large amounts of oestrogenic material could be excreted during pregnancy, since the oestrogenic hormones tend to cause the uterus to contract. This has now been solved by the observation of Marrion that 99 per cent. of the oestrogenic material is excreted in a combined form which is physiologically inactive. The interesting observation was also made that just before parturition the combined form of the hormone is greatly decreased while the amount of free hormone is greatly increased. In other words, the body is flooded with highly active oestrogenic material which perhaps initiates labor by sensitizing the uterus to some oxytocic substance. Attempts were made to isolate the combined form of oestriol or theelol. An amorphous compound in a high state of purity was obtained, which was shown to be undoubtedly a glucuronic acid derivative of oestriol, the aldehyde group of the glucuronic acid being involved in the linkage. The hormonal control of menstruation was discussed by Professor George W. Corner (University of Rochester). It was quite clearly shown that the oestrin deprivation theory of menstruation was untenable. Some indications were presented of the possible presence in the body of another hormone involved in the menstrual cycle, besides progesterone

and oestrin. The chemical and physiological aspects of progesterone, the hormone of the corpus luteum, were presented by Dr. Willard M. Allen (University of Rochester), and the clinical use of progesterone was discussed by Dr. Howard F. Kane (George Washington University). The use of this hormone in combatting habitual abortion was indicated. It acts probably through either inhibiting the excess oestrin in such individuals or substitutes for the decreased amount of progesterone secreted. The session was brought to a close by the observations of Dr. Carleton J. Marinus (Detroit) on the function of the ovary apart from its influence upon menstruation.

Friday morning's symposium took up other phases of female endocrinology and then considered various aspects of the male sex hormones. The session was opened by the discussion of Professor Leo Loeb (Washington University) of the relationship of the anterior pituitary gland to the thyroid and ovary. Evidence was presented of the presence in the anterior pituitary of a follicle destroying hormone in addition to the follicle stimulating and luteinizing factors. It was also shown that the anterior pituitary of cattle, humans and guinea-pigs differed from one another in the concentration of these hormones. A method was presented by which the cattle type could be modified to the human type and the latter to the guinea-pig type for implantation experiments. This affords a new method of studying these fundamental questions. The physiology of lactation was discussed by Professor Charles W. Turner (University of Missouri). The inter-relationship of theelin, progesterone and the lactogenic hormone of the anterior pituitary in the development of the mammary gland and secretion of milk was demonstrated by experimental work.

The discussion of the male sex hormone was opened by Professor Carl R. Moore (University of Chicago), who discussed various aspects of the general question of the hormone secretion by the mammalian testis. In the discussion of indicators of the hormone secretion, the action of the male sex hormone upon the seminal vesicles, vas deferens and prostate were brought out. A very interesting study of the sex cycle in the gopher was presented in which much significant data on the inter-relationship of the constituent parts of the male genital apparatus were presented. In discussing testis transplants it was emphasized that viable grafts were effective, but that non-viable grafts had no effect. It was also mentioned that hetero-transplants, if they persisted, apparently gave off no male sex hormone. The tissue is walled off and is in a mummified state. Professor Moore stated that the male hormone apparently does not stimulate testicular activity and its administration appears actually to be deleterious to testicular activity. The recent biochemical investigations on the male sex

hormones were taken up by Professor F. C. Koch (University of Chicago). The methods of assay, the isolation, proof of structure and artificial preparation of androsterone and testosterone were presented. Dr. D. Roy McCullagh (Cleveland Clinic) closed the discussion of the male hormones with a paper on the relationship of the sex hormones to the prostate gland. The question of prostatic hypertrophy was discussed in detail. Results were presented which indicated that there is some substance in fresh bull testes which relieves symptomatically prostatic hypertrophy. It is not known just how this is brought about, but a study of this important question may bring out unsuspected endocrine interrelationships.

Papers dealing with general subjects were read during the morning sessions, on both Monday and Tuesday. On Monday morning some observations concerning the spirale cochleae were presented by Dr. Dorothy Wolff (Washington University) which give a much clearer picture of the intricate architectonic neurone pattern in the spiral ganglia. Two papers on tetanus, one on the mechanism of the flocculation test in tetanus and one on the prophylaxis of idiopathic tetanus, were read by E. S. Sulkin (Washington University) and P. L. Varney (Washington University), respectively. Dr. Laura A. Lane (University of Michigan) contributed a very thorough study of cancer of the eye from an occupational standpoint. New information concerning the nature of the virus causing yellow fever and its behavior in the mosquito hosts, particularly in the yellow fever mosquito, *Aedes aegypti*, was given by Dr. Cornelius B. Phillip (U. S. Public Health Service). In addition he reported the finding that mosquitoes of certain species appear to be less favorable to the virus than *A. aegypti* and also require longer incubation periods. Another interesting observation was made that apparently some species retain the virus for life without successful transmission by biting. In the common malaria mosquito of tropical Africa, *Anopheles gambiae*, the virus has been found to disappear completely. Some important experiments on smoke combustion were the subject of a communication by Professor P. A. Shaffer and Dr. Robert Loeffel (Washington University). The occurrence of *Leptospira icterohemorrhagiae* and *Spirocheta morsus muris* in laboratory white mice (*Mus musculus*) at St. Louis (1933), and the extreme susceptibility and fatality of American deer mice (*Peromyscus*) to *Leptospira icterohemorrhagiae* was discussed by A. Paekchanian (Columbia University). The use and abuse of methylene blue as an antidote was discussed by Dr. W. B. Wendel (Washington University) and the mechanism of its action described. Seventy per cent. to 80 per cent. of the injected cyanide could be accounted for as cyanomethemoglobin when methylene blue was administered. It was sug-

gested that the latter converted hemoglobin to methemoglobin, which in turn united with the cyanide releasing the iron catalysts of the tissues, which would otherwise have remained tied up with cyanide. A very interesting outgrowth of studies of oestrogenic activity of extracts from human urine by Professor F. C. Koch and associates at the University of Chicago was related by Professor Koch. It was found that considerable amounts of para-cresol were excreted, and it was intimated that there might be a relationship between this and the oestrogenic substances. A comprehensive presentation of the social and scientific problems on the question of leprosy was given by Perry Burgess (American Leprosy Foundation, New York). The many puzzling and apparently contradictory facts concerning this problem, such as the questions of heredity, contraction of the disease, geographical distribution, cure and relief, were discussed. The social and economic aspects of segregation were pointed out and it was clearly indicated that this method of control in most lands is ineffective. The new program of the American Leprosy Foundation basic to the whole anti-leprosy campaign was outlined.

The Tuesday morning session was opened by the reading of two interesting papers on the nature of barbiturate action, by Professor T. Koppányi, Dr. J. M. Dille and Dr. C. R. Linegar (Georgetown University). The first paper took up the question of the peripheral action of barbiturates. The study revealed that a depression of the parasympathetic ganglia is produced. It was also shown that physostigmine opposes ganglionic paralysis, not only in the parasympathetic, but also in the sympathetic division of the autonomic nervous system. The second paper took up the question of the nature of the antagonism between the barbiturates and picrotoxin. Very promising results were obtained which indicated that the latter drug may be used clinically in combating overdoses of barbiturates. R. Lorente de No (Central Institute for the Deaf) and H. T. Graham (Washington University) studied the rate of transmission of nervous impulses through the synapses, using the ocular motor nerve. They found that ether blocked the synapse. The control of bronchial asthma was discussed by Dr. Noel F. Shambaugh and Dr. S. M. Alter (Los Angeles, Calif.). The general session was brought to a close by a discussion of bacteriophage therapy by Professor J. Bronfenbrenner and Dr. E. S. Sulkin (Washington University). Experiments with localized infections with staphylococcus demonstrated that bacteriophage application, either injected into the lesion or applied to the surface, did not promote healing. On the contrary, certain preparations of bacteriophage caused a temporary intensification of the local reaction to infection. Fur-

ther experiments indicated that this intensification was due to the presence in these preparations of the so-called "spreading factor."

Following this general session on Tuesday morning a joint session with the subsection on pharmacy was held. An account of the joint session on Wednesday morning with the American Society of Parasitologists is given in the report of that society.

The new Subsection on Dentistry held its first meeting on January 4 with sessions morning and afternoon and an evening dinner.

Research in dental science and in oral health-service has been increasingly active, especially in its biological phases, since the decade of 1911-20, during which the American Dental Association created its Research Commission and the *Journal of Dental Research* and the International Association for Dental Research were established, all of which have been influential in their several fields. The American Division of the International Association for Dental Research now consists of 17 sections in as many university centers in the United States, its members, selected in recognition of achievement in research, now numbering 266. The American Division, recently made an affiliate of the American Association for the Advancement of Science, sponsored on January 4 a very successful all-day "meeting for the advancement of dental science," with the cooperation of the American Dental Association, American Association of Dental Schools and the American College of Dentists, these four organizations constituting the Subsection on Dentistry. The program included morning, afternoon and evening sessions. A dinner, at which the St. Louis Dental Society was the host, preceded the last session. The presiding officers at the three scientific sessions were successively Dr. G. B. Winter, president, American Dental Association; G. D. Timmons, secretary, American Association of Dental Schools, and W. R. Davis, president, American College of Dentists. At the dinner, the chairman was Dr. R. C. Seibert, president, St. Louis Dental Society; the toastmaster, Dr. T. B. Beust, president, American Division, International Association for Dental Research. Among the after-dinner speakers were Drs. H. B. Ward, permanent secretary, American Association for the Advancement of Science; T. J. Hill, dental representative in the council, American Association for the Advancement of Science; G. B. Winter, president, American Dental Association; Rudolf Kronfeld, member of the Foundation for Dental Research, Chicago College of Dental Surgery; P. C. Kitchin, vice-president, International Association for Dental Research, and G. D. Timmons, secretary, American Association of Dental Schools. At the scientific sessions, 16 papers were read and discussed and 8 papers were read by title. In the general scientific exhibit, under the auspices

of the American Association for the Advancement of Science, dental features were contributed by the Council on Dental Therapeutics; Research Commission of the American Dental Association; St. Louis Dental Society; dental schools at Illinois, Louisville and Northwestern universities; and Drs. E. P. Brady, A. C. Engel, V. H. Frederick, O. A. Kelly, R. C. Wheeler and G. B. Winter, of St. Louis.

The research described in the sixteen papers that were orally presented carried dental science definitely forward on several fronts. To illustrate: Dr. Philip Jay (Ann Arbor), after an analysis of dietary recommendations by other observers for the control or prevention of decay of teeth and on the basis of results of his own studies, concluded that such decay is commonly increased in children by excessive ingestion of sugar (candy); that it is not associated with disturbance of nutrition; and that it is apparently a "bacterial disease which may be influenced by dietary changes in which the sugar content is highly important." In a study of dental decay among the Maya and Navaho Indians, Drs. T. J. Hill (Cleveland) and Morris Steggerda (Cold Spring Harbor, N. Y.) noted a very low incidence in both deciduous and permanent teeth and a definite correlation between the kind of diet and the location of decay, cavities on smooth surfaces of teeth being more frequent with diets high in content of carbohydrate. A definite topographical relationship between the germs of all deciduous teeth and their permanent successors has been established by Dr. W. H. G. Logan (Chicago), which relationship is very important in plastic surgery, orthodontia and other branches of health-service related to the oral structure of children. In a collateral study, Dr. Rudolf Kronfeld (Chicago) made definite corrections in the knowledge of postnatal development and calcification of the permanent dentition. Dr. Isaac Schour (Chicago) showed further influences of the pituitary, thyroid, parathyroid, adrenal and gonad glands, on the eruption, formation and calcification of the teeth. In the field of preventive orthodontia, Dr. S. J. Lewis (Detroit) demonstrated that ectopic eruptions of certain permanent teeth cause premature resorption (loss) of deciduous teeth, with resultant malocclusion, both of which can be obviated by diagnosis and corrective treatment of this abnormal process in its earliest stages. Drs. L. S. Fosdick and H. L. Hansen and Miss Charlotte Epple (Chicago), noting that saliva of various individuals converted sugar into lactic acid at different rates, found that saliva from "caries susceptible mouths" caused the reaction to occur at a much greater speed than saliva from "immune mouths," and on the basis of these results devised a chemical salivary-test for susceptibility to dental decay. Significant technical advances were noted in studies of tooth form (Dr. R. C. Wheeler,

St. Louis); minute anatomy of edentulous jaws (Dr. E. C. Pendleton, Chicago); movements of the temporomandibular joint caused by contractions of muscles of mastication (Dr. O. H. Stuteville, Chicago); phosphatase activity of various mouth organisms (Drs. L. S. Fosdick and H. L. Hansen and Miss Charlotte Epple, Chicago); microbiology of gingival inflammations (Dr. T. B. Beust, Louisville); relationship of oral tuberculous lesions to dental practice (Drs. C. G. Darlington and Irving Salzman, New York City); reaction of enamel and dentin to various chemical reagents (Dr. E. P. Brady, St. Louis); improvement of materials for denture bases (Dr. E. B. Owens, St. Louis), and use of sodium alkyl sulfate as a detergent in tooth pastes (Drs. P. C. Kitchin and W. C. Graham, Columbus). Abstracts of all the papers will be published together in the issue of the *Journal of the American College of Dentists* for March, 1936.

This meeting, the fourth successive annual dental program in conjunction with the American Association, was notable for its evidence of marked progress in dental research; the initiation of the stimulating affiliate relationship of the organized American workers in dental science; the beginning of practical cooperation among national dental organizations (four) for the advancement of science in dentistry; and the large attendance and increased interest not only of those engaged in dental research, but also of local practitioners and lay auditors. The scientific content and import of the meeting foreshadow cumulative achievement in dental science in this country.

The Subsection on Pharmacy held a session on Monday afternoon. George Reddish (St. Louis College of Pharmacy) discussed the potentialities and limitations of the phenol coefficient test. The fact was stressed that this test is of value only in standardizing compounds of a phenol-like nature and is not applicable to antiseptics. John H. Gardner (Washington University) discussed the chemistry of aloin. His researches raise the question as to the presence of an anthracene nucleus in this drug. Noel E. Foss (Duke University) studied the structure, pharmacology and bacteriological properties of a number of new unsymmetrical aryl sulfides. He finds the thymol derivative most germicidal. John C. Krantz, Jr., and associates (University of Maryland) reported studies on the pharmacology of trichlorethylene in order to test its usefulness as a therapeutic agent for angina pectoris. F. Scott Bukey (University of Nebraska) reported x-ray studies of the comparative value of enteric coating materials. Many widely used coating materials are of little value. Elmer H. Wirth (University of Illinois) reported on his extensive investigations of drugs, using microchemical methods. C. B. Jordan and George DeKay (Purdue University) pre-

sented the problems involved in the assay of crude drugs and chemicals for acceptance in the United States Pharmacopoeia XI. James C. Munch (United States Bureau of Biological Survey) reported observations on the differences in toxicology of strychnine salts obtained from different sources.

The Subsection also participated in a joint program with the Section on Medical Sciences on Tuesday morning. Marion Thompson (University of Maryland) discussed his researches on ergot, which show the active principle ergostetrine, isolated and named by him, is an alkaloid, the physiologically active principle of ergot, and identical with the principles isolated by Dudley, Moir, Kharasch and others. W. M. Firor and Arthur Grollman (Johns Hopkins University) reported on recent studies on disturbed metabolism in Addison's disease and evaluated some of the methods of treatment. K. K. Chen, C. L. Rose and G. H. A. Clowes (Indianapolis, Ind.) showed the value of sodium nitrate and sodium thiosulfate (intravenous) in cyanide poisoning. In animals and man this method proved to be superior to methylene blue.

SECTION ON AGRICULTURE (O)

(Reports from P. E. Brown, H. B. Tukey, Wm. H. Martin)

The sectional program arranged and presided over by Dr. H. K. Hayes, chairman of the section and vice-president of the association, consisted in a symposium on "The Conservation of the Land." The program was opened by the address of the retiring chairman of the section, Dr. Jacob G. Lipman, who discussed "The Conservation of Our Land Resources" from the general and broad, national standpoints. Professor C. R. Enlow (U. S. Soil Conservation Service) spoke on the subject "Regrassing of Semi-Arid Plains," presenting the technical and practical aspects of this important regional problem. Dean L. E. Call (Kansas State College) gave an illustrated discussion of the subject, "Cultural Methods of Controlling Wind Erosion," emphasizing the methods of proved value in preventing this destructive process. This program was arranged jointly with the American Society of Agronomy. This society also participated in a joint round-table conference on "Genetics and Plant Breeding," being represented on the program by Dr. H. K. Hayes.

The American Society for Horticultural Science held its annual meeting on December 31 and January 1. There were 214 papers presented, including papers on tree fruits, small fruits, vegetable crops, floriculture and ornamental horticulture. There were thirteen sessions, including a joint session with the Potato Association of America, a joint session with the American Society of Plant Physiologists and a joint

session with the Genetics Society of America, the American Society of Agronomy and the American Phytopathological Society. Round tables were conducted for extension workers and for teachers. The banquet was held on December 31, the principal address being given by Dr. H. H. Zimmerley, director of the Virginia Truck Experiment Station, and president of the society, on the topic "New Approaches to Edaphic and Nutritional Problems with Horticultural Plants." The president for the coming year is Professor Alex Laurie, of Ohio State University.

The twenty-second annual meeting of the Potato Association of America included a joint session on Tuesday afternoon with the American Society for Horticultural Science and one on Thursday afternoon with the American Phytopathological Society.

Progress in the development of potato varieties resistant to scab and the virus diseases was reported by E. S. Schultz, C. F. Clark, W. R. Raleigh and F. J. Stevenson, of the U. S. Department of Agriculture, F. A. Krantz, H. M. Darling, Harold Mattson and J. G. Leach, of the University of Minnesota, and Reiner Bonde, of the Maine Agricultural Experiment Station. In a discussion of what plant pathologists can and should contribute to a potato improvement program, J. G. Leach outlined a plan for testing the new potato introductions for disease resistance and adaptability in various parts of the country. A committee was appointed by the association to work with the Potato Improvement Committee of the American Phytopathological Society.

The following officers were elected: *President*, Julian C. Miller (Louisiana State University); *vice-president*, Fred H. Bateman (York, Pennsylvania); *secretary-treasurer*, Wm. H. Martin (New Jersey Agricultural Experiment Station); *members of executive committee*, F. A. Krantz, Miles Horst, E. B. Tussing.

SECTION ON EDUCATION (Q)

(Report from William S. Gray)

The papers presented during the first session reported results of studies relating to learning in the fields of reading and arithmetic. Ernest Horn (University of Iowa) emphasized the importance of a broad background of experience and information as a basis for intelligent interpretation. He maintained that well-organized generalizations are essential before leaving a particular unit or subject. Raleigh Schorling (University of Michigan) showed objectively that slow-learning pupils or dull normals can learn basic mathematical notions if appropriate teaching procedures are used. E. H. Taylor (Eastern Illinois State Teachers College) presented evidence showing a grad-

ual decline in the amount of college training in arithmetic provided for prospective elementary school teachers. This trend was deplored in view of the demands made upon such teachers. M. E. McCarty (superintendent, LaFayette, Indiana) showed clearly the effect on both progress in reading and achievement in other school subjects resulting from special and remedial training in reading. Paul A. Witty (Northwestern University) pointed out the extreme importance of interest in remedial instruction.

The central theme of the second session was "Personality: Its Nature, Genesis, Organization and Measurement." Raymond Wheeler (University of Kansas) urged that education shift its theoretical base from connectionism to Gestalt. C. H. McCloy (University of Iowa) showed that definable character traits could be statistically defined and that such precision would aid in planning character development. Robert G. Bernreuter (Pennsylvania State College) presented convincing data showing that personality rating scores were not invalidated by naive tendencies on the part of subjects, as has been currently suspected. H. Meltzer (Psychological Service Center, St. Louis) presented an ingenious attack on the problem of anger, involving a close record of particular appearances of the anger response followed by shrewd techniques to increase one's control of his anger. Otis C. Trimble (Purdue University) reported on the successful use of objective tests in securing facts other than the sheer scores.

The third session was held jointly with the Section on Psychology and comprised a symposium on "Maturation and Learning." Calvin P. Stone (Stanford University) traced in a very illuminating fashion the reproductive cycles of pigeons and white rats, pointing out the relationship of various factors. Beth Wellman (University of Iowa) presented data showing that intelligence is susceptible to training, that it can be measured accurately if the instrument used is fairly sensitive, and that preschool training is highly significant in promoting intellectual growth. Frank N. Freeman (University of Chicago) considered several methods of comparing intelligence, pointing out the fact that the IQ is not a valid basis in comparing children at different age levels. On the basis of gross scores on intelligence tests the rate of increase is most rapid from eight to fifteen. Leonard Carmichael (Brown University) abandoned some of the earlier hypotheses concerning behavior, maintaining that it is initiated blindly through internal stimuli but directed largely by external stimuli.

In harmony with the practice of previous years, the program following the joint luncheon with the Section on Psychology was limited to addresses by the retiring

vice-presidents of the two sections. (Report given by Section on Psychology.)

The fourth session was devoted to brief reports of research from field members and fellows. The final session was held jointly with the Section on Chemistry and the Division of Chemical Education of the American Chemical Society. The central theme was "The Teaching of Chemistry." It is reported by the Section on Chemistry.

ORGANIZATIONS RELATED TO THE ASSOCIATION AS A
WHOLE

American Association of University Professors

(Report from H. W. Tyler)

The twenty-second annual meeting of the American Association of University Professors, held in St. Louis in connection with the meetings of the American Association for the Advancement of Science, was attended by 175 delegates from 122 institutions, the largest registration in the history of the organization. The sessions were notable for the amount of important business, requiring extra time for consideration on the second day. Besides annual reports of regular committees, including that on academic freedom and tenure, more informal preliminary accounts of activities and plans were presented by the new committees on "The Effect of the Depression and Recovery on Higher Education and on Freedom of Speech." The two luncheons were addressed by President Maurer, of Beloit College, as representative of the Association of American Colleges, who spoke of the need of an active chapter in each institution, and by President Compton, who discussed the situation concerning teachers' oaths. New officers elected for a two-year term include Professors A. J. Carlson, *president*, and S. H. Slichter and Louise Pound, *vice-presidents*. During the past year a gain of 1,200 has brought the total membership of the association to nearly 13,000.

The Society of the Sigma Xi

(Report from Edward Ellery)

Sigma Xi held its thirty-sixth convention on Tuesday afternoon. Delegates were present from fifty-two of the sixty-six chapters and twelve of the thirty-five clubs, the largest attendance at a convention of the society since 1928. The Alumni Committee reported a distribution of \$1,800 as grants-in-aid to eleven of twenty-one applicants. Of the remaining ten applications, two withdrew before the committee acted, two were assisted to secure grants from another source, one was from an undergraduate in a Middle West university, who had never done any research work and had no project, one was without sponsors and four were in fields of research not included in the purpose of Sigma Xi. Hence in 1935, for the first time since the society

added this method of supporting research to its other activities, all the applications for grants-in-aid were granted.

The committee on Semi-Centennial announced that this important event would be celebrated in Ithaca on June 19 and 20. The program will include an unveiling of a bronze tablet commemorating the event, the award of two research prizes of \$1,000 each for research in progress in the life sciences and the physical sciences, and addresses by Dr. Karl T. Compton on "Sigma Xi and the Universities of the Future," by Dr. Willis Rodney Whitney on "The Accomplishments and the Future of the Physical Sciences" and by Professor Frank R. Lillie on "The Accomplishments and the Future of the Life Sciences."

Charters for chapters were granted Carleton College and the University of Buffalo.

Officers were elected as follows: *President*, W. F. Durand (Stanford University); *Secretary*, Edward Ellery (Union College); *Treasurer*, George B. Pegram (Columbia University); *Member of the executive committee*, R. A. Gortner (University of Minnesota); *Member of the alumni committee*, F. B. Utley (Pittsburgh).

The United Chapters of Phi Beta Kappa

(Report from Wm. A. Shimer)

The United Chapters of Phi Beta Kappa, as an affiliated society, joined with the American Association in inaugurating a series of annual public lectures to emphasize the cultural aspects of science and to encourage the synthesis of scientific and humanistic knowledge. President William Allan Neilson, of Smith College, delivered the first address of the series on Wednesday night in the Opera House of the Municipal Auditorium. Dr. Robert J. Terry, president of the Washington University Chapter of Phi Beta Kappa, presided at the meeting.

Borrowing the title of his address, "The American Scholar To-day," from Ralph Waldo Emerson's famous oration before the Harvard Chapter in 1837, President Neilson announced that he intended "to consider the main points made by Emerson in discussing the American scholar of a century ago, to ask how far they hold good to-day, and to draw from him what we can of wisdom and inspiration and guidance for the American scholar to-day." He said: "This meeting under the auspices of the United Chapters of Phi Beta Kappa and on the invitation of the American Association was conceived, I believe, as a symbol of the fundamental identity of two ideals. The sound humanist acknowledges the necessity for the scientist's zeal for precision and accuracy in the amassing of facts and for severe logic in manipulating them. The intelligent scientist pushes beyond the limits of his spe-

cial field to the significance of its data for mankind as a whole. The philosophy which this society proclaims as the guide of life is something much wider and yet closer to the facts of life than the traditional problems of metaphysics. It is a humanistic philosophy in the sense that it embraces everything everywhere and in every period that touches human life. The range and complexity of the knowledge which has already been amassed is universally acknowledged to be far beyond the grasp of any individual, however richly endowed."

"But, in spite of this," President Neilson said in conclusion, "there remains the obligation to vary our interests in an endeavor towards that type of balanced personality which wise leadership demands. The qualities and conditions necessary for the production of that type are still those which Emerson demanded—single-minded devotion to truth, courage, freedom and self-reliance. 'We will walk on our own feet; we will work with our own hands; we will speak our own minds.'"

In addition to the lecture, Phi Beta Kappa sponsored an exhibit of the society's quarterly magazine, *The American Scholar*—a review of the articles dealing with scientific subjects published by the journal to date as a result of its editorial ideal of providing "a whole diet for the whole mind."

American Nature Study Society

(Report from Nellie F. Matlock)

The American Nature Study Society opened its session on Monday morning with a visit to the Educational Museum of the St. Louis Public Schools and the Missouri Botanical Garden. Monday afternoon the society conducted an excursion to the Orchid House at Gray Summit, Missouri, stopping on the return trip at the Webster Groves Nature Study Museum. On Tuesday papers were presented by members and friends of the St. Louis and Webster Groves Nature Study Societies. Wednesday morning was devoted to the discussion of philosophies presented by Dr. E. Laurence Palmer, Dr. William Vinal and Professor Bayles, known leaders in the field of science. In the afternoon illustrated lectures were given by A. E. Shirling and D. G. Cooper, dealing with the matter of schoolroom procedure in the presentation of science.

On Wednesday evening a dinner meeting was held, with Dr. Karl Compton, president of the American Association, among the guests. The program consisted of impromptu speeches, music, a lecture on the "Vocabulary of Hypocrisy," by Hanor A. Webb, and Arthur Newton Pack's moving pictures of the Northwest. A joint session was held on Thursday with the American Science Teachers' Association.

American Science Teachers' Association

(Report from Harry A. Carpenter)

The third meeting of the American Science Teachers' Association was held in St. Louis on January 2. The morning and afternoon programs were attended by approximately 200 teachers. At the noon luncheon, Dr. Karl T. Compton, president of the American Association, addressed the group. He discussed the objectives of science education and presented reasons for the inclusion of science education in any program of general education. The morning program included the following illustrated addresses: "Missouri Botanical Garden as an Educational Institution for the Public," by Dr. George T. Moore (Missouri Botanical Garden); "Advances in Medical Science and Surgery with Special Reference to Diseases of the Glands of Internal Secretions," by Dr. Russell M. Wilder (Mayo Foundation for Medical Education and Research); "Radio To-morrow—The New Magic of Electrons," by Dr. Orestes H. Caldwell (editor of *Radio To-day*, New York City).

At the afternoon session the following subjects were discussed: "Ten Years of Science Books," by Dr. Hanor A. Webb (George Peabody College for Teachers, Nashville); "Pupils Ability to Generalize," by Dr. W. C. Croxton (State Teachers College, Saint Cloud, Minn.); "Evaluating Various Aspects of the Scientific Method," by Dr. Ralph W. Tyler (Ohio State University); "A Plan of Organization for the American Science Teachers' Association," by Dr. Phillip G. Johnson (Cornell University). Each of these papers provoked interesting discussion. All papers presented at the meeting will be published in the science educational journals. An exhibition of pupil work in science in the St. Louis schools was made available by W. F. Shay, head of the department of science, Normandy High School. These exhibits indicated skill and resourcefulness, both on the part of the pupils participating and their teachers.

A resolution was adopted petitioning the officers of the American Association for the Advancement of Science to grant affiliation with that organization.

A resolution was adopted providing for charter organizing membership in the American Science Teachers' Association on payment of one dollar to the treasurer. This resolution provided that all teachers who have contributed to the organization of the American Science Teachers' Association by letter or by attendance at the meetings at Boston in December, 1933; Pittsburgh, December, 1934; St. Louis, January, 1936, or who participate in the meeting, December, 1936, may be offered this charter membership. The charter membership fee is not determined as annual dues,

since the matter of dues will be determined later upon adoption of a constitution.

A proposed constitution was presented by Dr. Johnson which will be sent to all who are interested. Briefly, it proposes to organize the American Science Teachers' Association as a federation of existing local science associations with the objective of promoting their interests, assuming furthermore that each local organization will continue to be autonomous. The American Science Teachers' Association is intended to serve the interests of all and to unite all, in so far as they have common problems.

The following officers were elected: *President*, Harry A. Carpenter (Rochester, N. Y.); *first vice-president*, Morris Meister (New York City); *second vice-president*, Ada Weekel (Oak Park, Ill.); *secretary*, Ellsworth S. Obourn (Clayton, Mo.); *treasurer*, Homer LeSourd (Milton, Mass.).

The following organization committee was reelected with provision that the officers shall have the power to add to this committee as necessary: Dr. Florence Billig, Dr. Otis W. Caldwell, Mr. W. L. Eikenberry, Dr. John A. Hollinger, Dr. Phillip G. Johnson, Mr. Homer LeSourd, Mr. Wilhelm Segerblom, Dr. Ralph K. Watkins, Dr. Hanor A. Webb.

REPORT OF THE COMMITTEE ON GRANTS

Gentlemen:

Your committee in its meeting at St. Louis has given careful consideration to 25 applications for research aid totaling nearly \$9,000, whereas we have available only \$3,000. In conformity with the previous policy of this committee we have not as a rule felt at liberty to recommend grants for travel, field expenses or to pay the salaries of technical assistants but have limited the scope of our grants-in-aid to matters of needed research equipment and supplies. Your committee now recommends the following grants for the year 1936:

36-1	Howard A. Ball, for metabolic studies in hypophysectomized animals (for purchase of animals)	\$ 200.00
36-3	Donald B. Brand, for research on the origins and spreads of new world cultivated plants (to defray shipment charges for research materials)	100.00
36-4	H. O. Burdick, for research on physiology of fallopian tubes and factors controlling the passage of ova through these tracts (for purchase of animals)	100.00
36-7	Willi M. Cohn, for research on polarization of sky light by means of a new recording polarigraph (provisional on supplementing funds being found)	200.00
36-8	Robert H. Gault, for designing and con-	

	struction of the amplifying and receiving units in the teletactor to bring the whole apparatus up to certain requirements	350.00
36-9	Francis G. Gilchrist, for research on the significance of location in the structuring of an embryo (for apparatus and zoological material)	100.00
36-10	Herbert C. Hanson, for study of relationship of grassland type to soil type in the northern portion of the prairie, plains and foothill regions of the United States and Canada	200.00
36-14	J. Murray Luck, for research on the origin of the plasma proteins; the rôle of the liver in their formation	250.00
36-16	Gerald R. MacCarthy and H. W. Straley, III, for continuation of a geomagnetic survey of the Carolina Coastal Plain and adjacent areas	100.00
36-17	Reginald D. Maxwell, for study of occurrence of the avian malaras in nature, and the cross immune reactions of three new species of avian malaria parasites with one another and with others already known (for the purchase of zoological materials)	150.00
36-18	D. W. Morehouse, for study of the color excess of stars in the open star clusters among the galaxy (to provide half the estimated cost of building a double slide plate carrier)	300.00
36-19	L. P. Schultz, for research on ecology of the organisms in Lake Washington, or a biological fisheries survey of Lake Washington (for the purchase of scientific apparatus)	250.00
36-22	George D. Snell, for a study of the hereditary changes produced in the germ cells of female mice by x-rays, and of the abnormalities of development resulting therefrom (for providing animal cages and animals)	300.00
36-24	Jay R. Traver, for life history and ecological studies of mayfly fauna of southeastern United States (to provide collecting equipment)	150.00
36-25	W. L. Tressler, for a two-year limnological study of Chautauqua Lake, New York (to provide a micro-balance)	250.00
	Total	\$3,000.00

The failure of an application to receive recommendation for a grant should not be construed to mean that the proposal was judged to be mediocre. We are pleased to report that the requests were of high grade.

Respectfully submitted for the committee,

WALTER R. MILES,
Chairman