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

SCIENCE

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THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

GENERAL REPORTS OF THE SECOND NASHVILLE MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE AND ASSOCIATED SOCIETIES

GENERAL FEATURES

IN convocation week, from December 26 to December 31, was held at Nashville, Tennessee, the eighty-fourth meeting of the American Association for the Advancement of Science, the annual meeting for the association year 1927–28. This was the second Nashville meeting, the association having met in that city once before, in August, 1877. The sessions of the association and the associated societies were well accommodated mainly in the buildings of Vanderbilt University, the George Peabody College for Teachers and the Ward-Belmont College for Women.

President A. A. Noyes, eminent leader in chemical research and in chemical instruction, director of the Gates Chemical Laboratory of the California Institute of Technology, Pasadena, presided at the meeting and took part in many sessions. The retiring president, Dr. L. H. Bailey, well-known author and editor of articles and standard books on botany, horticulture and rural life, was unable to be present, because of convalescence from a serious illness, but he sent a note of greeting, which was read at the opening session.

Fourteen sections of the American Association appeared in the program of this meeting and thirty-five independent organizations of science workers met

with the association. Most of these are officially *associated,* and the majority are officially *affiliated* with the association. Their names will be shown in the reports on the sessions of sections and societies, in the next following issue of SCIENCE.

ATTENDANCE, SESSIONS AND PAPERS

One thousand six hundred and sixty-two persons were registered at the second Nashville meeting. While this registration is not so large as that for some other recent annual meetings, it and other features are indicative of very widespread interest and mark this meeting as very successful. For the sake of comparison, the registration records of the last eight meetings are shown below:

Third Chicago Meeting (Dec., 1920), 2,413.
Second Toronto Meeting (Dec., 1921), 1,832.
Fourth Boston Meeting (Dec., 1922), 2,339.
Third Cincinnati Meeting (Dec., 1923), 2,211.
Fifth Washington Meeting (Dec., 1924), 4,206.
Kansas City Meeting (Dec., 1925), 1,931.
Fifth Philadelphia Meeting (Dec., 1926), 3,181.
Second Nashville Meeting (Dec., 1927), 1,662.

It is certain that the number of persons actually in attendance was considerably larger than is indicated by the registration record, for many local people and some from away failed to register.

The residence distribution of those who registered at Nashville is shown by the accompanying list.

Registration at Nashville by States and Provinces

Alabama	41
Arizona	5
Arkansas	23
Australia	1
California	31
Colorado	7
Connecticut	19
Cuba	1
Delaware	5
District of Columbia	79
England	2
Florida	34
France	1
Georgia	40
Illinois	156
Indiana	57
Iowa	54
Kansas	33
Kentucky	38
Louisiana	43
Maine	3
Manitoba	3
Maryland	25
Massachusetts	38
Mexico	2
Michigan	59
Minnesota	27
Mississippi	29
Missouri	61
Montana	1
Nebraska	14
New Hampshire	3
New Jersey	17
New Mexico	1
New York	126
North Carolina	47
North Dakota	5
Ohio	111
Oklahoma	17
Ontario	11
Oregon	1
Pennsylvania	61
Porto Rico	3
Quebec	2
Rhode Island	9
Saskatchewan	2
South Carolina	19
South Dakota	1
Sweden	1
Nashville	67
Tennessee (outside of Nashville)	76
Texas	41
Utah	3
Vermont	3
Virginia	30
Washington	8
West Virginia	14
Wisconsin	48
Wyoming	3
Total	1,662

Altogether there were one hundred and sixty-three scientific sessions held at Nashville. Omitting about fifty papers presented by title only, 1,141 papers and addresses were delivered. There were thirty-one luncheons, dinners, smokers, etc., all well attended.

MEETING PLACES AND FACILITIES

The general hotel headquarters were at the Andrew Jackson Hotel, which very generously placed many complimentary rooms at the disposal of the association. Other hotels were headquarters for societies. About four hundred persons were lodged very conveniently and inexpensively in dormitories of the George Peabody College for Teachers and the Ward-Belmont College for Women and the hotel headquarters for some societies were in those dormitories, which were made specially available for this purpose. Meals and luncheons were served at the cafeterias of Wesley Hall and Kissam Hall, Vanderbilt University, at the cafeteria of the George Peabody College, at the dining room of the Ward-Belmont College for Women, and at the cafeteria of the Southern Y. M. C. A. Graduate School.

The registration offices (in charge of Mr. Sam Woodley, executive assistant, of the Washington office of the association), the news office (in charge of Mr. Austin H. Clark, news manager) and the general science exhibition (in charge of Major H. S. Kimberly, exhibition manager) were all in the lobbies of the Andrew Jackson Hotel.

A total number of twenty-three lanterns and twenty-two daylight screens were very kindly loaned by the Bausch and Lomb Optical Co., of Rochester, N. Y. The association hereby expresses to that firm its very appreciative thanks for this great help.

The Nashville educational institutions were very generous in helping to make this meeting a success. Rooms for the sessions were placed at the disposal of the association by Vanderbilt University, the George Peabody College for Women, the Southern Y. M. C. A. Graduate School and the Scarritt College for Christian Workers. To all these institutions the association and the associated organizations are very grateful.

The Nashville Chamber of Commerce was very generous to this convention and a large degree of credit and appreciative thanks for the very successful outcome are due to the indefatigable personal interest and industry of Mr. W. N. Porter, convention secretary of that organization.

Dr. W. S. Leathers, professor of medicine and public health, Vanderbilt Medical School, was general chairman of the Nashville committees. He devoted himself with great efficiency and tact to the very complicated preparations throughout many months before the meeting opened. To his able general oversight and foresight in this work the association and the associated societies owe very much indeed.

Mr. John W. Barton, vice-president of the Ward-Belmont School, was very active as chairman of the committee on general arrangements and of the committee on finance and the results of his very generous and efficient services were much in evidence throughout the meeting. To him the association and all who attended are very grateful indeed.

All the members of the several local committees and the representatives for the several sections of the association, whose names are shown below, joined in the great cooperative work that made the second Nashville meeting so very satisfactory; to them is here expressed the hearty gratitude of the association and of all who attended this meeting.

LOCAL COMMITTEES FOR THE SECOND NASHVILLE MEETING

General Chairman of Nashville Committees

W. S. Leathers, M.D., professor of preventive medicine and public health, Vanderbilt Medical School.

Committee on Arrangements

John W. Barton, *chairman*, vice-president of Ward-Belmont School.
J. A. Webb, *secretary*, professor of chemistry, George Peabody College.
L. C. Glenn, professor of geology, Vanderbilt University.
G. Canby Robinson, dean and professor of medicine, Vanderbilt Medical School.
J. T. McGill, professor emeritus of organic chemistry, Vanderbilt University.
A. E. Parkins, professor of geography, George Peabody College.
W. N. Porter, convention secretary of the Nashville Chamber of Commerce.
J. M. Breckenridge, professor of chemistry, Vanderbilt University.
G. R. Mayfield, associate professor of German, Vanderbilt University.
A. F. Ganier, assistant engineer, N. C. and St. Louis Railroad.
H. H. Shoulders, president of the Nashville Academy of Medicine.
E. L. Bishop, state health commissioner of Tennessee.
A. W. Wright, assistant professor of pathology, Vanderbilt Medical School.
H. C. Weber, superintendent of the Nashville Public Schools.

Committee on Finance

John W. Barton, *chairman*
Henry E. Colton
Charles M. McCabe

Committee on Meeting Places

A. E. Parkins, *chairman*
F. J. Lewis
R. E. Baber
W. H. Hollinshead
W. D. Strayhorn

Committee on Hotels and Housing

W. N. Porter, *chairman*
Lee J. Loventhal
S. J. Garrison

Committee on Exhibition

J. M. Breckenridge, *chairman*
F. B. Dresslar
E. W. Goodpasture

Committee on Local Transportation

A. F. Ganier, *chairman*
J. P. W. Brown
W. F. Pond

Committee on Publicity and Non-technical Lectures

G. R. Mayfield, *chairman*
H. A. Webb
T. J. Horner
T. H. Alexander
J. S. Stahlman, Jr.

Committee on Entertainment

A. W. Wright, *chairman*
C. P. Connell
Mrs. A. B. Benedict
W. W. Carpenter
T. Graham Hall
Thomas E. Jones

Local Representatives for Sections of the Association

Section A (Mathematics): C. M. Sarratt
Section B (Physics): C. R. Fountain
Section C (Chemistry): L. J. Bircher
Section D (Astronomy): James McClure
Section E (Geology and Geography): L. C. Glenn
Section F (Zoological Sciences): E. E. Reinke
Section G (Botanical Sciences): J. M. Shaver
Section H (Anthropology): W. D. Weatherford
Section I (Psychology): Joseph Peterson
Section K (Social and Economic Sciences): C. B. Duncan
Section L (Historical and Philological Sciences): H. C. Sanborn
Section M (Engineering): W. H. Schuerman
Section N (Medical Sciences): P. D. Lamson
Section O (Agriculture): K. C. Davis
Section Q (Education): S. J. Phelps
For Organizations not related to Any Particular Section: C. P. Connell

OFFICIAL REPRESENTATION AT THE NASHVILLE MEETING

Cards of invitation were sent out, as usual, asking research institutions and laboratories and scientific organizations to name representatives for the meeting. Following are the names of those that did so: University of Arizona; University of California; Stanford University; University of Denver; Wesleyan University; Carnegie Institution of Washington; Federal Horticultural Board; National Research Council; Smithsonian Institution; U. S. Department of Agriculture; U. S. Coast and Geodetic Survey; U. S. Bureau of Entomology; U. S. Public Health Service; U. S. Weather Bureau; War Department; Northwestern University; Drake University; Iowa State College; University of Kentucky; Clark University; Harvard University; Wellesley College; Worcester Polytechnic Institute; University of Michigan; University of Minnesota; St. Louis University; Washington University; New Jersey Agricultural Experiment Station; American Museum of Natural History; Brooklyn Botanic Garden; College of the City of New York; Cooper Union; University of Rochester; Rockefeller Institute for Medical Research; Case School of Applied Science; Marietta College; Oberlin College; Ohio Wesleyan University; Western Reserve University; Haverford College; Mellon Institute of Industrial Research; University of Pittsburgh; Brown University; University of Texas; West Virginia University; Eastman Kodak Company, Rochester, N. Y.; B. F. Goodrich Company, Akron, Ohio; Incandescent Lamp Department of General Electric Co., Nela Park, Cleveland, Ohio; Leeds & Northrup Company, Philadelphia, Pa.; Western Electric Company, New York, N. Y.

Many other organizations and institutions were unofficially represented at the meeting, and it is probable that some official representatives failed to register as such.

THE PRELIMINARY ANNOUNCEMENT AND THE GENERAL PROGRAM

The preliminary announcement of the Nashville meeting appeared in SCIENCE for December 2, 1927, occupying about seventeen pages of that issue, which was sent to all members of the association. It contained the usual preliminary information about the meeting, including statements about the many section and society programs. The latter statements were based on material supplied by the section and society secretaries.

The secretaries also supplied the manuscripts for their programs as these appeared in the general program of the meeting and most of the manuscripts were at hand by December 15. The editing and printing of the general program, a book of over 130 pages, was again in the hands of the program editor, Dr. Sam F. Trelease, of Columbia University. Dr. Trelease and Mrs. Trelease went to Nashville and devoted themselves, day and night, to this work from December 15 to the time the book was finished, on the day before Christmas. This is a very difficult kind of material from the editorial viewpoint, a large proportion of the composition being classified headings and subheads, technical words and phrases and personal names. Our hearty thanks are again due to Dr. and Mrs. Trelease, and also to the botanical department of Columbia University, of which he is a member, which made it possible, as in recent years, for the program editor to devote so much time to the general program during more than a month just preceding the meeting.

A new feature of the general program this year is a fourteen-page index of names of persons reading papers or delivering addresses, an index of about 1,200 entries. This index, which represents about fifteen hours of practically uninterrupted labor on the part of the editor and Mrs. Trelease—for it could not be prepared till page proofs of the book were available and no minute could then be lost—is an exceedingly valuable feature of the general program, which was used and appreciated by every one.

Sixteen pages of advertising—of books and apparatus for science work—are included in the Nashville program, the income from which helped to pay the

cost of printing the book. The hearty cooperation of the advertising firms is greatly appreciated. Their names are shown below. An E following a name indicates that the firm thus designated had an exhibit in the general exhibition.

American Association for Medical Progress, Inc. (E), 370 Seventh Avenue, New York, N. Y.
Baker and Co., Inc., 54 Austin St., Newark, N. J.
Bausch and Lomb Optical Co. (E), Rochester, N. Y.
Brooklyn Botanic Garden, 1000 Washington Ave., Brooklyn, N. Y.
Eastman Kodak Co., Rochester, N. Y.
General Biological Supply House (E), 761 East 69th Place, Chicago, Ill.
General Radio Co., 30 State St., Cambridge, Mass.
Kny-Scheerer Corporation of America, 10 West 25th St., New York, N. Y.
Lancaster Press, Inc., Lancaster, Pa.
E. Leitz, Inc. (E), 60 East 10th St., New York, N. Y.
Mallinckrodt Chemical Works, St. Louis, Mo.
Open Court Publishing Co., 337 E. Chicago Ave., Chicago, Ill.
Thermal Syndicate, Ltd., 58 Schenectady Ave., Brooklyn, N. Y.
Triarch Botanical Products (E), Botanical Laboratory, University of Pennsylvania, Philadelphia, Pa.
University of Chicago Press (E), 5750 Ellis Ave., Chicago, Ill.
Victor Talking Machine Co. (E), Camden, N. J.
John Wiley and Sons, Inc., 440 Fourth Ave., New York, N. Y.
Williams and Wilkins Co., Mt. Royal and Guilford Aves., Baltimore, Md.

The typographical and artistic excellence of the general program are largely due to the very fine work of the Cullom and Ghertner Co., of Nashville, who cooperated very cordially with the program editor in every respect.

REDUCED RAILWAY FARES

Reduced railway rates, on the certificate plan, were available for those who attended this meeting, as has been true of recent meetings. The money-saving to those who took advantage of this arrangement amounted to one fourth of the regular railway fare; that is, the reduced rate for the round trip was one and one half times the regular one-way fare. The total number of railway certificates validated at Nashville was 1,057. They represented an aggregate of $25,701.18 for the one-way trips to Nashville and an aggregate of half of that amount, or $12,850.59, for the return trips. The total amount saved through the availability of the reduced rates was therefore $12,850.59, which amounts to an average saving per person of $12.15. This constitutes a very tangible service accomplished by the association for its members and for the members of the organization meeting with it.

THE SCIENCE EXHIBITION

The general science exhibition was arranged in the lobby of the Andrew Jackson Hotel, where the registration and the news offices were also located. The general exhibition was in charge of the exhibition manager, Major H. S. Kimberly, who was ably assisted by the local committee on exhibition, the chairman of which was Professor J. M. Breckenridge, of Vanderbilt University. The management of the Andrew Jackson Hotel, in charge of Mr. Turney M. Cunningham, was very helpful and cooperated cordially in this as well as in other features of the arrangements. The displays of the exhibitors were intensely interesting to all present and the exhibition played a very important part as the main social center of the meeting.

The following is a list of the firms and organizations that occupied booths. The names of those that also had advertising space in the general program are each followed by an A.

American Association for Medical Progress (A), New York, N. Y.
Bausch and Lomb Optical Co. (A), Rochester, N. Y.
P. Blakiston's Son and Co., Philadelphia, Pa.
Central Scientific Co., Chicago, Ill.
Coleman and Bell Co., Norwood, Ohio.
Denoyer-Geppert Co., Chicago, Ill.
General Biological Supply House (A), Chicago, Ill.
General Electric Co., Schenectady, N. Y.
La Motte Chemical Products Co., Baltimore, Md.
Leeds and Northrup Co., Philadelphia, Pa.
E. Leitz, Inc. (A), New York, N. Y.
Southern Biological Supply Co., Inc., New Orleans, La.
Spencer Lens Co., Buffalo, N. Y.
Triarch Botanical Products (A), Philadelphia, Pa.
University of Chicago Press (A), Chicago, Ill.
University of North Carolina Press, Chapel Hill, N. Car.
Victor Talking Machine Co. (A), Camden, N. J.
Weston Electrical Instrument Corporation, Newark, N. J.

An exhibit of photographs of the region of the Great Smoky Mountains was interesting to those who like the out-of-doors. It was contributed by the Knoxville Chamber of Commerce. Several fine exhibits by the special scientific societies were housed at the Southern Y. M. C. A. Graduate School. It is unfortunate that we have not yet reached the time when these special exhibitions by scientific societies can be given adequate notice in the general program and in these reports. Information concerning them seems always to be inadequate for more than mere mention. We shall continue to try to secure good accounts of them in time for printing in the programs of future meetings.

THE FIFTH AWARD OF THE AMERICAN ASSOCIATION PRIZE

The American Association prize of $1,000 is awarded annually to the author of a notable contri-

bution to the advancement of science given at the annual meeting. The funds are generously supplied by a member who wishes his name withheld. Nominations for the Nashville prize were received from the secretaries of the sections and societies and the award was made by the committee on prize award and announced through the news service Friday evening.

The winner of the prize is this year Dr. H. J. Muller, professor of zoology in the University of Texas, for his outstanding contribution entitled "Effects of X-Radiation on Genes and Chromosomes," which was presented before the Joint Genetics Sections of the American Society of Zoologists and the Botanical Society of America, in the Wednesday-morning session. The following abstract of Dr. Muller's paper has been contributed by him, having been sent from Austin, Texas, by air mail.

"The Effects of X-Radiation on Genes and Chromosomes."

(*Abstract*)

This paper reported the author's experiments of the past fifteen months on the hereditary effects on X-rays applied to the fruit fly, *Drosophila melanogaster*. By means of special courses, the discrimination of mutations in individual genes from genetic recombinations of various sorts (due to segregation, non-disjunction, etc.), was facilitated, and lethal as well as visible changes were rendered detectable. Results in the second and later generations, based on several thousand cultures, showed that gene mutations had occurred in the most heavily treated germ cells at about 150 times the frequency of those in the controls, derived from the same source, while in germ cells less heavily treated the result was intermediate. Germ cells in all stages studied were susceptible to the effect: these included oögonia, ova, spermatozoa shortly before fertilization, and spermatozoa when rayed either in the male or in the female receptacles six or more days prior to fertilization.

The induced mutations resembled spontaneous ones, inasmuch as: (1) The great majority were lethal; of the rest most, but not all, reduced viability or fertility. (2) Recessives greatly outnumbered definite dominants. (3) Many of the visible effects were relatively inconspicuous. (4) Though "new" mutations were somewhat more frequent, there were also numerous repetitions of familiar mutations. (5) All regions of the chromatin were affected, but the induced mutations were more densely distributed in those regions of the linkage map in which more spontaneous mutations have occurred. (6) Multiple allelomorphism occurred. (7) So also did reverse mutation of genes already mutant when treated. The two latter facts argue against the effects always being complete losses or inactivations. (8) Though point-mutations were the rule, there was an occasional "line-mutation" involving a row of neighboring genes, as if by an electron that had passed parallel to the chromonema. (9) The vast majority of the treated genes, both mutant and normal-seeming, remained stable in their inheritance throughout succeeding generations, though at least one case of an "eversporting" condition arose.

Evidence was secured (by making use of non-disjunction) that only one of the two identical genes, or allelomorphs, present in a diploid cell, is caused to mutate at a time. The effect on a given gene, in a haploid germ cell, is "fractional," in that only a fraction of the resulting embryo will receive mutant gene material, the remainder being of normal gene content. Since there is no evidence of an indiscriminate intermingling of the mutant and normal tissues thereby arising, it becomes unlikely that the gene is compounded of many interchangeable members. This is also evidenced by the stability of treated genes in heredity.

Besides gene mutations, frequent rearrangements of gene order—involving inversions, translocations, duplications, etc., of chromosome sections—were found, by genetic evidence, to be produced by X-rays. These provided information concerning various questions. For example, cytological verification of two such cases yielded direct evidence for the physical validity of the linkage maps and of the corollary theory of crossing-over.

H. J. MULLER

JANUARY 8, 1928.

The committee on award this year was composed of the members named below:

Robert J. Terry, *chairman*, professor of anatomy, Washington University, St. Louis, Mo.

L. J. Cole, professor of genetics, University of Wisconsin, Madison, Wis.

William Duane, professor of biophysics, Harvard University, Cambridge, Mass.

G. Canby Robinson, professor of medicine, Vanderbilt University, Nashville, Tenn.

Charles Schuchert, professor of paleontology, Yale University, New Haven, Conn.

To these gentlemen is here expressed the gratitude of the association for their efficient service in this important and delicate part of the association's work.

The complete list of winners of the American Association prize is as follows:

(1) The Cincinnati award, January, 1924. L. E. Dickson, for contributions to the theory of numbers.

(2) The Washington award, January, 1925. Divided equally between Dr. Edwin P. Hubble, for con-

tributions on spiral nebulae, and Dr. L. R. Cleveland, for contributions on the physiology of termites and their intestinal protozoa.

(3) The Kansas City award, January, 1926. Dr. Dayton C. Miller, for contributions on the ether-drift experiment.

(4) The Philadelphia award, January, 1927. Dr. George D. Birkhoff, for mathematical criticism of some physical theories.

(5) The Nashville award, January, 1928. H. J. Muller, for contributions on the influence of X-rays on genes and chromosomes.

Special attention should be called to the purpose for which the prizes are awarded; that is, to stimulate interest in high-class contributions at the annual meetings and to encourage the presentation of the best American scientific work on these occasions. The more noteworthy advances made during the year in every field of knowledge should always be presented at the annual meeting. It is the hope of the donor of the American Association prize that it may serve each year as a concrete and tangible aid to some American science worker, enabling him to go further along his chosen line.

THE NEWS SERVICE AT NASHVILLE

(Report by Austin H. Clark, News Manager)

The outstanding feature of the Nashville meeting as compared with previous meetings was the increased interest on the part of the press, an interest which was clearly demonstrated by the high standing in their profession of all the representatives of newspapers, magazines and publishers of books who were in attendance. This increased interest in the proceedings was accompanied by a remarkable increase in the general appreciation of scientific work and a determination to present science to the people in a thoroughly dignified way. Certain aspects of science in the recent past have given rise in Tennessee to a considerable amount of controversy, and it might have been expected that at this meeting the local papers would seize the opportunity of reviving the discussion. Nothing of the sort occurred. On the contrary, the local papers handled a delicate situation in such a masterly way as to give a new broader meaning to the phrases southern courtesy and southern hospitality.

The gentlemen who reported the meeting for the daily papers were the following:

John L. Cooley, science editor, Associated Press.
W. M. Darling, Associated Press, Nashville.
Watson Davis, Science Service.
David Dietz, science editor, Scripps-Howard papers; also representing the NEA Service.
Richard FitzGerald, Jr., Nashville *Tennessean.*
William S. Howland, Nashville *Tennessean;* also representing the United Press and the *Christian Science Monitor.*
Coleman B. Jones, science editor, Associated Press.
Stanley Johnson, Nashville *Banner.*
Waldemar Kaempffert, science editor, New York *Times.*
Allen Shoenfield, Detroit *News.*
E. B. Stahlman, Jr., Nashville *Banner.*
Frank Thone, Science Service.

Of the scientific magazines *Popular Mechanics,* Chicago, was represented by Mr. J. Earle Miller, and *Science* and the *Scientific Monthly* were represented by Professor J. McKeen Cattell and Mr. Jaques Cattell. Mr. Frank Parker Stockbridge examined the material presented at the meeting, with a view to preparing a series of feature articles.

It is worthy of special mention that for the first time the Associated Press was represented by its science editors, and the New York *Times* was also represented by its science editor.

For the first time publishers of scientific books were prominently in evidence. There were present, to look over the situation and to make contracts, Mr. Edward M. Crane, president of the D. Van Nostrand Company, New York; Mr. Robert S. Gill, secretary-treasurer of the Williams and Wilkins Company, Baltimore, and Mr. Charles C. Thomas, of Springfield, Illinois.

The success of the news service at the Nashville meeting was due in no small degree to the energy and ability of the local committee on publicity, of which the chairman was Professor George R. Mayfield, of Vanderbilt University. Professor Mayfield not only handled the preliminary announcements and arrangements for the news service in a very effective way but also throughout the meeting he was daily in touch with the news office, materially assisting the work of the news manager.

The plan of handling the abstracts sent in was the same as that adopted at the Philadelphia meeting last year (see SCIENCE for January 28, 1927, pages 80–81). There were received by the news service altogether 415 abstracts and papers. Of these thirty-seven were mimeographed and the remainder were classified as follows: A, 27; B, 32; C, 91; D, 184; it was not found necessary to mark any of them X this year. No less than forty-four abstracts were received after the papers had been read; because of their lateness these could not be used by the news service. The number of abstracts received was smaller than the number received last year, but this fact in no way represents a falling off of interest in the news service, nor does it indicate any decline in the value of the material presented. The difference is entirely ac-

counted for by the fact that the authors of many highly technical papers, which would be quite unintelligible to the layman, refrained from submitting abstracts.

Thanks to the energy and foresight of Professor Mayfield and to the able assistance of Dr. Frank Thone, an unusually comprehensive radio program was offered in connection with the meeting, which was arranged by the association and Science Service jointly. The talks were as follows:

Friday evening, December 23, Station WSM.—"The Meeting of the American Association for the Advancement of Science at Nashville." Professor George R. Mayfield, Vanderbilt University.

Tuesday evening, December 27, Station WSM.—"Photographing the Planets." Dr. Robert G. Aitken, Lick Observatory.

Wednesday evening, December 28, Station WSM.—"New Miracles with X-rays." Professor Winterton C. Curtis, University of Missouri.

Wednesday evening, December 28, Station WSM.—"The Natural History of Children." Dr. William E. Ritter, president of Science Service.

Thursday evening, December 29, Station WSM.—"The Sea." Austin H. Clark, Smithsonian Institution.

Thursday evening, December 29, Station WBAW.—"Wild Life in Louisiana." Percy Viosca, Jr., state biologist of Louisiana.

Friday evening, December 30, Station WSM.—"Floods of the Mississippi from a Meteorological Standpoint." Dr. Harry C. Frankenfield, U. S. Weather Bureau.

THE GENERAL AND COMPLIMENTARY PROGRAMS

There were nine general sessions of the association at Nashville, and four evening lectures especially arranged for the students and the general public of the city.

The opening session, on Monday evening, December 26, was held in the auditorium of Nashville's beautiful and imposing War-Memorial Building. The convention was opened by Dr. W. S. Leathers, general chairman of the local committees on preliminary arrangements, who introduced Dr. James H. Kirkland, chancellor of Vanderbilt University, and Judge Grafton Green, chief justice of the Supreme Bench of Tennessee. Dr. Kirkland welcomed the scientists on behalf of the educational and scientific institutions of Nashville. Judge Green extended to them the welcome of the state of Tennessee and the city of Nashville.

The chair was then taken by Dr. Arthur A. Noyes of the California Institute of Technology, president of the American Association. In reply to the addresses of welcome, Dr. Noyes delivered an address which will be printed in the next issue of SCIENCE.

The main address of the opening session of the annual meeting is regularly given by the retiring president of the association, who was this year Dr. L. H. Bailey, of Ithaca, N. Y., eminent authority and writer in botanical science, horticulture and rural life and editor of many most useful books of reference. Dr. Bailey was unfortunately unable to be present at Nashville, because of convalescence from a serious illness, but a note from him was read by Dr. W. J. Humphreys, general secretary of the association.

The opening session was completed by an invited lecture on the Mayan remains in Yucatan and Guatemala, by Dr. Sylvanus G. Morley, of the Carnegie Institution of Washington, who gave a fascinating account of his recent excavations. Beautiful and instructive lantern slides were shown.

The general reception followed the opening session. It was held in the Andrew Jackson Hotel and was well attended. Refreshments were served and very enjoyable entertainment was furnished by the Fisk University Singers. These are selected from among the students of Fisk University, of Nashville, the oldest college of liberal arts for Negroes in America. They preserve the unique, simple, spiritual character of the old Negro folk-songs and melodies of the old South. The local committee on entertainment, the chairman of which was Professor A. W. Wright, of Vanderbilt Medical School, merit the thanks of all who attended the reception, which was unusually enjoyable and successful.

For the first time in the history of the annual meetings of the American Association a reception was given Monday evening to Negroes interested in science, by Fisk University, which has been mentioned just above. For this special feature the association is indebted to Dr. Thomas E. Jones, president of Fisk University.

The second general session, Tuesday evening, in the auditorium of the War-Memorial Building, was held jointly, according to custom, with the Society of the Sigma Xi. The sixth annual Sigma Xi Lecture was given on this occasion, by Dr. Clarence Cook Little, president of the University of Michigan, eminent authority and student in the field of genetics and eugenics. The title of his address was "Opportunities for Research in Mammalian Genetics." The lecturer emphasized the great need for intensive research on mammalian genetics, pointing out the certain applications of the results of such research in the improvement of domestic animals and in physiological and psychological genetics as related to human pathology and medicine.

"The Distribution of Scientific Knowledge" was the topic of a symposium occupying both forenoon and afternoon on Wednesday. The several speakers represented the points of view of the investigator,

the journal editor, the book publisher, the writer of scientific feature articles, the press syndicates and the editor of a metropolitan newspaper.

The fifth Josiah Willard Gibbs Lecture of the American Mathematical Society was delivered at a general session on Wednesday afternoon at 4:30. In this session, as in recent years, the association joined with the American Mathematical Society, under the auspices of which the Gibbs lecture is given. The lecturer this year was Professor Ernest W. Brown, eminent mathematician and astronomer, of Yale University. Professor Brown's subject was "Resonance in the Solar System."

"Edward Emerson Barnard, his Life and Work" was the subject of an illustrated lecture by Dr. Robert G. Aitken, of the Lick Observatory, given at the general session Wednesday evening, in the auditorium of the War-Memorial Building. This was the retiring vice-presidential address for Section D (Astronomy). Edward Emerson Barnard was a son of Nashville. Born in this city in 1857, Barnard was graduated from Vanderbilt University in 1886. He made many very valuable contributions to astronomy and was a leader and authority in his field. He died in 1923.

Two general sessions occurred on Thursday afternoon, one presenting a symposium on the "Economic Relations of Science Workers" and the other a symposium on "Aquiculture." The former of these was under the auspices of the association's Committee of One Hundred on Scientific Research, of which Dr. Rodney H. True, of the University of Pennsylvania, is secretary. At this symposium President Noyes gave the opening address, which was followed by papers on the "Relation of Research to Wealth Increase," by Harrison E. Howe; "Comparative Salary Scales of Trained Men," by Rodney H. True; and "Family Budgets of University Faculty Members," by Jessica B. Peixotto. A discussion followed.

The symposium on Aquiculture was arranged under the auspices of the Committee on Aquiculture, recently organized through the National Research Council. The program was in charge of Dr. Robert E. Coker, of the University of North Carolina. Several important papers on various aspects of marine biology were presented. The Committee on Aquiculture invites the counsel and cooperation of those interested in hydrobiological research or in the practical development of aquiculture. It is hoped that botanists, zoologists, geologists, chemists, meteorologists, engineers, economists and others may cooperate to promote the utilization of water areas for the culture of fishes, water birds, crustacea, pearl mussels, fur-bearing mammals, aquatic and swamp plants, etc.

The Thursday evening session was devoted to a lecture on "Science and the Newspapers," by Dr. William E. Ritter, president of Science Service. One of Dr. Ritter's main thoughts in this lecture is expressed as follows: "Science and journalism are both very powerful influences in modern civilization, but they have developed independently in large measure and they are sometimes more or less antagonistic. A study of the work of such men as Benjamin Franklin and Thomas Jefferson, who combined scientific research with ardent support of the newspapers and who mightily influenced our material development, leads to the thought that closer cooperation is needed between the scientists and the journalists."

An illustrated lecture on "Slow-Motion Pictures of Sounds and their Bearing on Speech and the Psychology of Audition" was given at the Friday evening symposium, by Professor Mark H. Liddell, of Purdue University. He presented some of the results of his recent studies on the physics of the sounds of human speech, in which new and highly refined physical methods have been employed. Records of sound waves were shown and different kinds of sounds and noises were produced and compared.

Four non-technical lectures were arranged for the week of the meeting, complimentary to the people of Nashville, including school and college students. These were well attended. The speakers and their topics were as follows:

Tuesday evening. Dr. William M. Mann, director of the National Zoological Park, Washington, D. C. "Collecting Wild Animals for Our National Zoo," with motion pictures.

Wednesday evening. Dr. C. E. K. Mees, director of the research laboratory of the Eastman Kodak Co., Rochester, N. Y. "Production of a Photographic Image," with lantern slides and motion pictures.

Thursday evening. F. R. Moulton, of Chicago. "Science and Civilization."

Friday evening. Mr. Arthur Sterry Coggeshall, curator of education in the Carnegie Museum, Pittsburgh. "Turning Back the Clock Ten Million Years, an account of the Age of Dinosaurs," with slides and motion pictures.

Seven radio talks were given, as shown in the preceding section.

THE COUNCIL ROLL AT NASHVILLE

The affairs of the association are entirely in the charge of the council, which consists of the president, the fifteen vice-presidents, the treasurer, the general secretary, the permanent secretary, the fifteen section secretaries, the council representatives of the affiliated societies and state academies, the eight elected council members and those members of the executive committee who are not otherwise members of the council.