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of the
Indiana Academy
of Science

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PAUL WEATHERWAX, EDITOR

Field Meeting held at
Indiana University Biological Station, Winona Lake
May 21, 22, 1937

Fifty-third Annual Meeting
Manchester College, North Manchester
November 4-6, 1937

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OFFICERS AND COMMITTEES, 1937

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Psychology, P. R. HIGHTOWER, Central Normal College.
Zoology, W. P. ALLYN, Indiana State Teachers College.

EXECUTIVE COMMITTEE

(Past Presidents, Officers, Divisional Chairmen, and Chairmen
of Standing Committees)

Allyn, W. P.; Andrews, F. M.; Arthur, J. C.; Behrens, C. A.; Black, Glenn A.; Blanchard, W. M.; Blatchley, W. S.; Bruner, H. L.; Burrage, S.; Butler, A. W.; Cogshall, W. A.; Coulter, Stanley; Cumings, E. R.; Davis, J. J.; Deam, C. C.; Enders, H. E.; Foley, A. L.; Friesner, R. C.; Guernsey, E. Y.; Hightower, P. R.; Hessler, R.; Kintner, E.; Lyon, Jr., M. W.; Mahin, E. G.; Martin, E. S.; Montgomery, B. E.; Morgan, W. P.; Moenkhaus, W. J.; Mottier, D. M.; Naylor, J. P.; Noyes, W. A.; Payne, F.; Malott, C. A.; Perkins, Leroy; Porter, C. L.; Potzger, J. E.; Powell, H. M.; Ramsey, R. R.; Rettger, L. J.; Robbins, C. K.; Scott, Will; Steinbach, L. I.; Test, L. A.; Wade, F. B.; Wallace, F. N.; Weatherwax, Paul; Wilkinson, P. D.; Witmer, S. W.; Wright, J. S.

STANDING COMMITTEES

(Appointed by the President; first named on each committee is chairman.)

- Archeological Survey:** E. Y. Guernsey, Eli Lilly, W. N. Logan, Glenn Black, C. A. Malott, R. E. Esarey.
- Auditing:** E. S. Martin, William Johnson.
- Biological Survey:** B. E. Montgomery, Winona Welch, C. M. Palmer, S. R. Esten, M. W. Lyon.
- Library:** J. E. Potzger, Will Scott, W. E. Edington, Glenn Black.
- Membership:** S. W. Witmer, F. E. Beghtel, M. S. Markle, L. J. Rettger, Winona Welch, G. Don Klopp, O. B. Christy, Wm. Thornbury, E. R. Martin, Theodor Just, A. R. Bechtel, C. E. Deppe, R. E. Girton, Edward Kintner, F. R. Elliott, W. J. Tinkle, Henry Nester.
- Program:** Leslie Steinbach, J. C. Nelson, J. E. Williams, W. J. Tinkle, G. H. Evans.
- Publication of Proceedings:** J. J. Davis, C. E. Behrens, E. R. Smith, F. B. Wade, M. E. Hufford, Paul Weatherwax.
- Relation of Academy to State:** F. N. Wallace, J. S. Wright, Stanley Coulter, Will Scott.
- Research:** A. L. Foley, J. S. Wright, E. G. Mahin, W. E. Edington, R. B. Abbott.
- Representative on A.A.A.S. Council:** H. E. Enders.
- Nominations:** To be announced later.
- Junior Academy of Science:** H. E. Enders, F. B. Wade, O. B. Christy, W. P. Allyn.

MEETING OF THE COUNCIL

LAFAYETTE, INDIANA, MARCH 7, 1937.

The meeting was called to order by President Edington, in the Faculty Lounge of the Union Building, at 1:30 P. M., with the following members present: W. P. Allyn, W. M. Blanchard, Glenn A. Black, A. W. Butler, J. J. Davis, W. E. Edington, H. E. Enders, A. L. Foley, R. C. Friesner, P. R. Hightower, C. A. Malott, S. E. Martin, B. E. Montgomery, W. P. Morgan, W. L. Perkins, C. L. Porter, H. M. Powell, C. K. Robbins, Will Scott, L. I. Steinbach, L. A. Test, F. B. Wade, Paul Weatherwax, and P. D. Wilkinson.

Committees reported as follows:

Auditing:—Mr. Martin stated the Treasurer's report was correct and his report was approved.

The Treasurer reported that the state had granted an appropriation of \$1500, \$1000 to be used for publication of the proceedings and \$500 for binding. It was estimated that the material now in the library could be bound in three years with such an appropriation. Dr. Friesner made a motion, amended by Dr. Butler, that Miss Nellie Coats be made a member of the Academy and be a member of the Library Committee as long as she is librarian. The motion carried.

Publication of Proceedings:—Dr. Weatherwax reported that the manuscript was about ready for the printer. He asked the Academy to appropriate \$200 to cover expense of publication not taken care of by the \$1000 appropriated by the state. This amount was voted. He stated that a list of the entire membership of the Academy will be published this year but only new members will be published for the next four or five years. This report was received and approved. The Editor asked if the meetings of the Entomologists and Botanists which are held at the same time as the fall Academy meeting should be published in the proceedings. Consent was given that this be done.

The Editor also asked that the State Library be made headquarters for the Academy. Consent was given.

It was suggested that each author in the Biological Division abstract his own paper and send to the editor who in turn will send it to the editor of Biological Abstracts.

Science Service has suggested that papers too long to be printed in the Proceedings be abstracted for publication and the entire paper deposited with them. They would then undertake to furnish photographic copies to anyone who might care for the entire paper. This suggestion was by consent left with the Publication Committee. It was also suggested that if the entire paper is not published in the Proceedings, the abstract of the paper handed to the division chairman be published in the Proceedings. This suggestion was referred to the committee for Program Improvement.

The Editor asked for suggestions on the publication of the Proceedings.

A motion was made that the Executive Committee express to the Committee on Relations of the Academy to the State its appreciation of the Committee's work in securing the appropriation of \$1500 from the State Legislature for the work of the Academy. Motion carried.

Research Committee:—Dr. Foley asked how much money was available, no money having been reported paid out and no reports received from those to whom the grants were made. Dr. Morgan reported \$150 was paid out last year, \$100 coming from the A.A.A.S. and \$50 from the Academy. This year, we are informed, the A.A.A.S. grant will be \$125. Prof. Wade reported that the income from the Academy Foundation fund is now about \$230 per annum. The Secretary was instructed to ask that the A.A.A.S. grant be sent direct to the Treasurer so that he may have a complete record of all funds. A motion was made and carried that the Research Committee recommend and transmit to the secretary of the Academy the names of grantees with the subjects of their investigation and the amount granted each and that the secretary in turn transmit this information to the A.A.A.S. with the request that the check for the amount be sent to the Treasurer of the Academy. The same procedure was also to apply to the Foundation funds.

New Business:—The President announced the appointment of a committee to co-operate with the Indianapolis committee arranging for the A.A.A.S. meeting next winter. The following were appointed on this committee: A. W. Butler¹, Chairman; F. B. Wade, Vice-Chairman; T. E. Mason, R. R. Ramsey, W. M. Blanchard, S. S. Visher, C. A. Malott, J. J. Davis, F. Payne, H. G. Nester, M. S. Markle, H. R. Kraybill, F. D. Brooks, W. M. Lyon, Jr.; A. A. Potter, T. M. Bushnell, S. E. Perkins, III.

In answer to a question of an Academy exhibit at the time of the A.A.A.S. meeting a motion was carried to appoint a committee to consider the question of an exhibit, and if attempted, the nature of the exhibit.

A motion that the officers of the Academy present annually an estimate of their probable expenditures was tabled.

The question of the taxation of the Academy funds under the new laws was raised and Prof. Wade was asked to investigate.

The following committee on Program Improvement was announced by the Chairman: R. C. Friesner, Chairman; J. J. Davis, E. R. Smith, F. J. Allen, W. P. Allyn, H. M. Powell, Glenn Black, J. B. Dutcher, R. C. Davis.

The Chairman announced that Dean Howard E. Enders had been appointed to represent the Indiana Academy of Science at the inauguration of Dr. Clyde Everett Wildman as President of DePauw University on March 10, 1937.

Adjourned 4:00 p. m.

L. A. TEST, *Secretary.*

¹ Walter G. Gingery was later made co-chairman with F. B. Wade in place of A. W. Butler, deceased.

MINUTES OF THE SPRING MEETING

The business session of the Spring meeting was called to order by President Edington in the dining room of the Westminster Hotel at Winona Lake, May 21, 1937, at 7:30 p. m.

Professor Friesner presented the report of the committee on Improvement of Program. Action was postponed until the fall meeting.

President Edington brought up the question of the possibility of the state high school teachers' being excused from their work so that they might attend the fall meeting of the Academy, placing it on the same basis as the State Teachers Association. He suggested that the matter be taken up with the State Superintendent of Public Instruction. A motion was passed that the President appoint a committee of three to take up the matter with the Superintendent of Public Instruction and report at the fall meeting. Professor E. R. Smith of DePauw University was made chairman of this committee.

A motion was passed that a committee be appointed to prepare exhibits for the Academy and the Junior Academy, at the time of the meeting of the American Association for the Advancement of Science in Indianapolis this fall. This committee consists of S. E. Perkins III, N. E. Pearson, O. B. Christy, C. L. Porter, and C. O. Pauley.

The date for the fall meeting was discussed and the second or third week end in November seemed to be preferred.

A motion by John S. Wright that an amount up to \$50 be paid from the Academy funds for the use of the Exhibit Committee was carried.

Dr. Weatherwax spoke briefly of the progress of the printing of the Proceedings and urged that all proof be returned as promptly as possible. He stated that the Proceeding would be smaller than last year.

It was suggested that the names of section chairmen be sent out with the preliminary notices next fall so that authors might know to whom to send their abstracts.

Professor Kintner, Chairman of the Program Committee, spoke briefly of the program for the meeting.

The evening's program was then carried out as scheduled.

About 40 turned out for the bird hike Saturday morning, but the rest of the day's activities were more or less spoiled by rain.

PROGRAM OF THE WINTER MEETING

MANCHESTER COLLEGE, NORTH MANCHESTER

NOVEMBER 4-6, 1937

THURSDAY, NOVEMBER 4

7:30 p. m. Meeting of the Executive Committee.

FRIDAY, NOVEMBER 5

9:30 a. m. General Session.

Music—Cantilena Choir, Manchester College.

Address of Welcome—President Otho Winger, Manchester College.

Response for the Academy—President Will E. Edington.

Business Session.

Necrology—Read by Dean Emeritus Stanley Coulter, Purdue University.

Amos W. Butler

John B. Dutcher

Stacy O. Hawkins

R. E. Nelson

Will E. Scott

“Regional contrast in rainfall intensity in Indiana and some effects thereof.”

S. S. Visher, Indiana University.

“Notes on a suggested treatment for fall hay fever.”

Ernest Rice Smith, DePauw University.

11:00 a.m. Sectional Meetings. For programs of the sections see: archeology, p. 46; bacteriology, p. 58; botany, p. 71; chemistry, p. 115; geology and geography, p. 143; mathematics, p. 189; physics, p. 192; psychology, p. 212; zoology, p. 226.

12:15 p. m. Luncheon.

1:30 p. m. Sectional meetings continued.

4:30 p. m. Tea for members of the Academy and their guests through the courtesy of the Faculty of the College.

6:30 p. m. Annual Dinner.

Business Session.

Music—Madrigal Club, Manchester College.

Colored Motion Photomicrography Film “The Formation of Crystals,”

Kent H. Bracewell, Hamline University.

President’s Address—“Science and Modern Thought.”

Will E. Edington, DePauw University.

SATURDAY, NOVEMBER 6

- 9:00 a. m. Junior Academy of Science, Business meeting and exhibits.
See page 311.
- 9:00 a. m. Entomologists' meeting. See page 315.
- 9:00 a. m. Taxonomists' meeting. See page 315.
- 1:00 p. m. Program of Junior Academy. See page 311.
- 2:00 p. m. Football game—Manchester College vs. Albion College,
Michigan. Members of the Academy and of the
Junior Academy were invited to see the game as
guests of the College.

MINUTES OF THE EXECUTIVE COMMITTEE

MANCHESTER COLLEGE

NOVEMBER 4, 1937

The meeting was called to order at 7:30 p. m. by President Edington. The minutes of the Executive Committee for March 7, 1937, were read and approved, as were the minutes of the spring meeting, held at Winona Lake, May 21, 1937.

Officers and Committees reported as follows:

Academy Foundation. Chairman Frank B. Wade reported as follows as of November 1, 1937:

Receipts	
Balance from previous year	\$ 165.08
Interest on investments	259.46
Sale of \$500.00 N. Y. Central R. R. Bond.....	570.03
From a friend of the Academy	500.00
Total	\$1,494.57

Expenditures	
Withdrawal from bank for purchase of \$500.00 N. Y. Central R. R. Bond.....	\$ 565.46
Purchase of \$500.00 U. S. Treas. Bond.....	577.10
Total	\$1,142.56
Balance in bank	\$ 352.01

Present Assets at Par Value	
U. S. Treas. Bonds.....	\$4,700.00
Cons. Fed. Farm Loan Bonds.....	1,500.00
Common Stock S. Oil Co. Ind.....	150.00
Pref. Stock Muncie Masonic Temple.....	200.00
Total	\$6,550.00
Total market value of funds (approx.).....	\$7,067.00

Archeological Survey. An informal report was given by Glenn A. Black in the absence of Mr. Guernsey. The work last summer was a

continuation of that carried on during the previous summers in the northern and southern parts of the state.

Auditing Committee. Mr. Martin stated that no report could be given at this time since the Academy year does not close until December 31. The books for last year were correct and in excellent shape. Mr. Wade asked that the Auditor check the books of the Trustees.

Biological Survey. In the absence of the Chairman, B. E. Montgomery, Dr. M. W. Lyon read the report:

Very little work has been done on the bibliography of the Indiana Biota during the year, except that certain collaborators, especially Doctor Welch, have continued to add cards listing the titles of current papers containing references to Indiana records in their special fields. The Committee wishes to repeat the observation made last year, "Members of the committee and collaborators cannot develop much enthusiasm in the preparation of a manuscript which must wait indefinitely for publication and which, in the meantime, requires constant revision to include new titles as they appear." However, it may be noted that the bibliography could probably be completed within a short time if any definite plan for publication were adopted.

The status of Deam's flora of Indiana and Montgomery's Odonata of Indiana is the same as last year; both are practically complete.

Investigations on the fauna and flora of the state by members of the Committee and others have continued. Dr. Welch spent several weeks in the field, collecting mosses and liverworts in 21 counties. A report of her records is included in the program of the present meeting of the Academy. In addition to bryophytes she collected a few algae, which were forwarded to Dr. Palmer, and some lichens, which were determined by Dr. Raymond Torrey of New York and returned to the DePauw Herbarium. Three undergraduate students at Purdue University have selected investigations on certain insect groups in Indiana as thesis subjects and have begun the compilation of published records and the collection of material. These are Ralph Morris, working on the Formicidae, or ants, Bernard P. Kolkana, on the Culicidae, or mosquitoes, and Philip Luginbill, Jr., on the Orthoptera, or grasshoppers. The manuscript of a similar work on one of the sub-families of leaf hoppers, made by Harry E. Brown two years ago, is now in process of publication.

The Committee recommends, as it has done for several years, that the Academy call to the attention of the officials and citizens of the state the desirability of building a fire-proof museum for the storage of scientific specimens which have been collected in Indiana or elsewhere, so that they may be available to scientists of the state for study. Many of our sister states, notably Illinois, Michigan, and Ohio, have excellent facilities for the preservation and study of scientific specimens. Much valuable material has been sent out of the state because of the lack of a suitable place for its preservation here and this loss will continue until an adequate museum is established. The committee notes with satisfaction that arrangements for the permanent preservation within the state of the Deam and Blatchley collections have been made within the last few years. If adequate funds for a museum building could be furnished to the state universities or to an independent research museum, enough material would soon be secured to place Indiana on a level with neighboring states.

A motion was made by Dr. Lyon that the Secretary correspond with the state officials and call attention of the public to the need for a fire-proof State Museum. This motion was amended by Dr. Potzger to read that a committee be appointed to take charge of this matter. Motion carried as amended.

Bonding Committee. Dr. Bruner reported that notice of the annual premium for the bonding of the Trustees of the Academy Foundation had been forwarded to the Treasurer. The bonded Trustees include the Treasurer and two other Trustees elected by the Executive Committee for a period of four years. According to the conditions of

election, the term of service of Trustee John S. Wright expired in 1936. A motion to refer the matter of a successor to Mr. Wright to the nominating committee was carried.

Editor. Dr. Weatherwax, as Editor, reported as follows:

Volume 46 of the Proceedings, which was delivered to the State Library for distribution early in September, consisted of 282 pages. The edition was increased 100 copies over that of last year; of the 1600 copies printed, 1000 were bound in cloth and 600 in paper covers.

The total cost of manufacture of the volume and the reprints was \$1421.89. Of this amount, \$421.89 was paid by the Academy, and \$1000 by the state. From authors of reprints, will be returned \$157.09, and \$73.84 is chargeable to the Academy for reprints of memorials and the membership list and for reprints furnished free to authors. The net cost to the Academy was \$190.96. The cost of the volume per printed page was \$4.135. Certain changes in arrangement and in style of type have increased slightly the average amount of material per printed page.

One hundred reprints of the necrology have been prepared for distribution to authors of memorials and members of the families of the deceased. Five hundred reprints of the membership list were also prepared. By issuing these to new members and publishing changes in membership each year, the publication of the complete list of members can be postponed for several years.

Dr. Enders moved that the list of Junior Academies be published each year in the Proceedings. Motion Carried.

Library Committee. Dr. Potzger read the following report:

Your Library Committee had little occasion to display great activity during the past year. The affairs of the library are at a stage where the efficient service of Miss Coats meets the current problems. Her report to the Committee presents the most vital problems before us:

"The Indiana Academy of Science Library is now receiving some 279 serials regularly in exchange for the Indiana Academy Proceedings, sent to 234 institutions and learned societies, 93 of which are American, 141 of which are foreign. Eleven new titles have been added since the last report made in May.

"Some progress is being made with the binding. Four-hundred forty-five volumes will be bound within the next few weeks at an estimated cost of \$500.00. Something like 500 more volumes are ready and should be bound very soon if some method can be found for financing the work. Additional volumes should be bound also if funds can be supplied for purchasing the numbers necessary to complete them. Many numbers have been furnished by the issuing agencies but some are out of print and are no longer available there. It is hoped that this year we may enter into exchange agreements with a longer list of scientific societies and institutions and thus increase the number of publications received by the library.

"There is in process of compilation at the present time a union list of the serials in some 40 Indiana libraries, and your librarian is adding to this check list the titles owned by the Academy of Science. The inclusion of these titles in a general list available in most libraries should greatly increase their usefulness."

It might be well to add to my report here the cardinal points of the May letter to the Academy.

Of the 28 Academies of various states, 17 were sending material to our library. Four of the non-exchanging academies issued publications which would in the future be sent on exchange. These are: Minnesota Academy of Science, New York Academy of Science, Ohio Journal of Science, South Carolina Academy of Science. Thirty new titles were added from other scientific institutions and societies.

A motion by Dr. Coulter that a vote of thanks be given to Miss Coats for her efficient work in the Academy was passed.

Membership Committee. Dr. Witmer submitted a summary of new members for last year stating the numbers interested in each of the various branches of Science:

This report is, in part, a review of the applications of the new members elected last year. Each prospective member indicates on the application blank the department of science in which he is interested or engaged. Last year the following departments were included: Mathematics, Bacteriology, Physiology, Entomology, Chemistry, Geology, Physics, Mammalogy, Biology, Psychology, Botany, Anthropology, General Science, Nature Study, Metallurgy, Genetics, Geography and Ecology. This list is presented for the purpose of giving some idea of the range of departments touched in one way or another by the activities of the Academy.

This year the membership committee is still, at this point, making up its new list of applications. At this moment we have in hand some 31 applications. The chairman will be available between sessions to receive any additional applications that are still unreported. He is also able to supply application blanks to those who intend to use them.

Press Secretary. Dr. M. W. Lyon, Jr. made the following report:

During the year the Press Secretary sent in three reports of meetings to SCIENCE which were published. To the same journal he sent death notices of two of our past presidents, Amos Butler and Will Scott, and wrote a brief obituary of Amos Butler for the JOURNAL OF MAMMALOGY, of which Butler was one of the founders.

Not knowing what arrangements had been made at the previous meeting, he also sent several telegrams to various important papers regarding the election of new officers and the meeting place for this year.

At the time of the Spring Meeting the Press Secretary was ill, and asked the publicity agent of Indiana University to get out suitable press notices as the meeting was being held at the Summer School of the University, and the late Dr. Scott was in charge of the scientific work.

The Press Secretary recommends that, during the periods of the Academy's activity, subscription be made to a news-clipping agency in order to find out whether newspapers pay any attention to his reports. These clippings, if any, could be turned over to Professor Edington to file with his other historic documents.

Program Committee. Professor Kintner spoke of the difficulty of knowing just what arrangements were necessary and how many programs are needed. At his suggestion a motion was made and carried that a committee of three be appointed to formulate suggestions for the work of committee chairmen and division chairmen and for other officers as needed.

It was moved and carried that the programs of the meetings be sent before the meetings, by the Press Secretary, to various papers of the state.

Publications of Proceedings. The report was read by Dr. Weatherwax and contained a number of important suggestions:

Your Committee on Publication of Proceedings begs leave to submit the following recommendations:

1. That the status of the Editor be changed by making this office appointive, the appointment to be made annually by the officers of the Academy (i. e. the Council) at the Annual Meeting of the Academy.

2. That the Committee on Publication of Proceedings be nominated by the Nominating Committee after consultation with the Editor, such committee to include representatives of each branch of science represented on the Academy program. Papers submitted for publication may, at the discretion of the Editor, be referred to the qualified member of the Publication of Proceedings Committee to determine their qualification for publication in the Proceedings. This suggestion, if approved, will necessarily increase the size of the committee to include a representative of each science division of the Academy, at present nine.

3. That the Academy appropriate annually a sum, not to exceed \$200.00, for use by the Editor for the employment of qualified assistance.

4. That the Proceedings include abstracts of papers not to be published in full in the Proceedings, and, so far as possible, a citation given of the place of publication or probable place of publication of the complete paper.

5. That the Editor arrange with Science Service for their services, which provide for the deposition of complete copies, including tables, graphs, etc., for papers too long or with too large number of tables for publication in the Proceedings. Film strip copies of such papers will be furnished by Science Service to anyone requesting same, at a nominal

cost. It is understood that an abstract of papers deposited with Science Service will be published in the Proceedings and the availability of the complete paper through Science Service noted.

6. Your committee reiterates its previous ruling that papers submitted to the Academy for publication in the Proceedings must not be submitted to other technical publications; also that papers submitted for publication to a technical publication not be submitted for use in the Academy Proceedings. Any infringement on this ruling will necessitate definite citation.

It was moved and carried that the Editor be granted \$200.00 for use in hiring necessary clerical help.

The report of the Publication Committee was approved and it was voted that this committee have a copy of its report sent to each member of the Executive Committee, these recommendations to be voted upon at the spring meeting.

Relations of the Academy to the State. Mr. Frank N. Wallace presented a brief report regarding the appropriation which the committee had secured from the State Legislature:

Your Committee begs to report that they made a request of the Budget Committee for an appropriation of \$3,000.00 as per the instructions of the Academy. The Budget Committee would not recommend \$3,000.00 but did put in \$2,000.00. The House of Representatives cut this to \$1,500.00 and this amount was to print our Proceedings and pay for the binding of the papers belonging to the Academy. I wish to thank the members of the Committee for their very great assistance and also thank Mr. Virgil M. Simmons for his valuable help in securing the \$1,500.00.

Research Committee. Dr. Foley made a brief report on the grants made last year.

A grant of \$75.00 was voted to Dr. Ira T. Wilson of Heidelberg College, Tiffin, Ohio, for work to be done on sedimentation in the lakes of northern Indiana. The committee wants it made clear that it is not establishing a precedent in making this grant to one connected with a college outside of Indiana.

Dr. Winona Welch, Associate Professor of Botany, DePauw University, was granted \$100 for a continuation of her studies of Indiana bryophytes. Her field trips covered a distance of 1870 miles, yielded 2080 packets of mosses and liverworts, and 11 new species and varieties. To date Miss Welch has expended but half her grant, reserving the remainder for field trips during the late winter and spring to study species that do not fruit during the summer months. A partial report of her work was presented at the last meeting of the Academy and has been published in this year's Proceedings. She expects to publish a complete report a year hence.

A grant of \$50 was made to Scott McCoy, an independent botanist of Indianapolis. To date he has expended but \$17.92 of his grant. He has run a total of 1290 10 x 10-meter quadrats in Jennings County forests, and has located other type forests in Jennings, Jefferson, Jackson, and other counties in the southeastern lobe of the Illinoisian area. He has taken 66 soil samples at surface, 3-inch, and 12-inch levels, and expects to make a "sociological study of the flora."

A grant of \$50 was made to Assistant Professor C. M. Palmer, of Butler University, for a study of the distribution of Lemanea in southern Indiana. A full account of the results of the study is to be presented at this meeting of the Academy and will be published in the Academy Proceedings. Mr. Palmer worked in 28 counties, traveled 2430 miles, and found Lemanea in 65 locations in 16 counties. He discovered an interesting and unsuspected relation between Lemanea and geological formations.

A grant of \$50 was made to Professor R. E. Martin, of Hanover College, for a study of the minimum stopping distances of cars with modern tires and on modern roads. A full report of the work is presented at this Academy meeting and will be published in the Academy Proceedings. In general, Mr. Martin found that the stopping distance is greater than that claimed by some manufacturers and very much greater than that many automobile salesmen would have their customers believe is possible, an exaggeration that is partly responsible for the frightful auto death toll.

Treasurer. The complete report was deferred until the end of the fiscal year, December 31. The following report was later made by Treasurer Morgan and approved by the Auditing Committee:

Receipts	
Balance on hand January 1, 1937.....	\$ 753.20
Dues and initiation fees collected.....	839.00
A.A.A.S. Refund for Research Grants.....	125.00
Author's Reprints Vol. 45.....	19.87
Author's Reprints Vol. 46.....	148.21
	\$1,885.28
Disbursements	
1—Program Committee	\$ 107.25
2—Expenses of Editor.....	94.08
3—Expenses of Secretary.....	26.72
4—Expenses of Treasurer.....	51.00
5—Mailing Proceedings	112.22
6—Expenses Press Secretary.....	23.24
7—Stationery	52.04
8—Indianapolis Engraving Co.....	176.21
9—Fort Wayne Printing Co.....	170.53
10—Junior Academy Bulletins.....	20.00
11—Surety Bonds and Safety Deposit Box.....	20.50
12—Research Grant	100.00
13—Expense Refund to Officers and Chairmen.....	12.13
14—Funeral Floral Memorials.....	10.35
15—Expense Fund Local A.A.A.S. Meeting.....	100.00
	\$1,076.27
Bank Balance	809.01
	\$1,885.28

Junior Academy. Dr. Enders made the report:

Your committee on the Junior Academy of Science has continued in touch with 28 active clubs of last year and has endeavored to stimulate them to high accomplishment by correspondence and circulation of the *Science Club Service*, published by Louis Astell, and made available by the payment of \$20.00 by the Academy for this purpose.

In preparation for our meeting this week, your chairman has sent out 75 letters of invitation to principals of high schools, whose clubs are not now affiliated with the Junior Academy. The letter related the history of the Indiana Junior Academy of Science and set forth the effectiveness of the stimulus that other science clubs have received by their affiliation with it. Special attention was directed to the striking exhibits and demonstrations and the program by members of the Junior Academy at its Saturday sessions. The principals were urged to bring the matter to the attention of their most aggressive science club leaders and to encourage them and a few of their club members to attend the Saturday sessions, where they may have an opportunity to observe what is accomplished by the affiliated clubs.

We expect to have seven or more new clubs for proposal to membership at this session. In nearly every instance the new club membership brings with it the application of the sponsor to membership in the Indiana Academy of Science. The new proposals will raise the membership of the Junior Academy from 28 to a number somewhat less than 40.

We have reason to believe that the Academy has rendered a valuable service within the state by cooperating with the Illinois Academy of Science and other academies in the publication of the *Science Club Service*, a small publication of source material for the affiliated academy clubs. We recommend that the Indiana Academy of Science again approve an allotment of \$20.00 toward the co-operative publication in 1937-38 of the *Science Club Service* under the direction of Mr. Louis Astell, Urbana, Illinois. Copies of the publication, as they are issued, are supplied the active and prospective clubs. The DuPont de Nemours Company has made up a circulating exhibit, to be used by high school

clubs, on the production and use of the synthetic rubber originated by our deceased Past President Nieuwland. Duplicate exhibits are to be made available for circulation among our clubs. We have reason to believe that we may secure a similar exhibit and program material in plastics and textiles from the same concern.

An article by Robert Littell in the October number of the *Readers Digest*, under the title, "Staying After School For Fun," grew out of the participation of your chairman in the broadcast at Atlantic City, last December, on the Student Youth Movement, in which he emphasized the dearth of source material for use of Junior Academy of Science Clubs in the preparation of their programs. The response of the DuPont Company was stimulated by the same broadcast.

The Junior Academy exhibits and program are scheduled for Saturday morning and afternoon. We urge as many members of the Academy as possible to attend these sessions, particularly to view the exhibits of the clubs which will be installed on Saturday morning. Last year about 20 clubs were represented at the meeting, and 160 Junior Academy members and sponsors were present at the sessions. The exhibits and the program this year will excel those of former years. We are eager, therefore, to have members of the Indiana Academy of Science show their interest in this phase of the work of your committee.

It was voted that \$20.00 be turned over by the treasurer of the Academy for the work of the Junior Academy.

Nominating Committee. Dr. Enders reported the following nominations for fellows of the Academy: Glenn A. Black, Eli Lilly, S. E. Perkins III, Frank N. Wallace. Dr. E. G. Mahin was nominated to succeed himself on the Research Committee for a term of five years, and Dr. Ray C. Friesner to same committee for two years, filling out the unexpired term of C. C. Deam who resigned. Mr. John S. Wright was nominated for reelection to the Board of Trustees, term to expire in 1940. All were elected.

Program Improvement. (Special Committee.) The report was presented by Dr. Friesner and, after discussion and amendments, was finally adopted in the following form:

1. The committee feels that two actions taken at the Danville meetings of the Academy will be likely to result in improvement of the program, viz. (a) no paper will be accepted on the Academy program to be "read by title"; (b) an abstract of each paper must be sent to the chairman of the section before the title will be placed on the program.

2. The committee recommends that abstracts of all papers appearing on the program be published in the Proceedings regardless of where the paper itself is published.

3. Honorable mention shall be made for outstanding papers in each section, such papers to be determined by the Research Committee and names to be read at the dinner meeting.

4. We recommend that each divisional chairman present an address, not to exceed 30 minutes, before the forenoon meeting of the section over which he presides.

Excusing Teachers for Academy Meetings. Dr. E. R. Smith presented the following report:

Walter Gingery, Principal of Washington High School, Indianapolis, appeared before annual meeting of Superintendents to appeal for their encouragement to the high school teachers of science to attend meetings of the Academy. Letters, enclosing program of meeting, were written by Dr. Edington to all superintendents within 50 miles of North Manchester in towns of 1000 or over, to all to within 50-100 miles in cities of 2500 or over, and to those within 100-150 miles in cities of 5000 or over.

Co-operation with A.A.A.S. Mr. F. B. Wade reported the work well organized and the two committees working together.

Committee on Exhibits. Report given by Dr. Edington reported that the committee hoped to have on exhibit information about the Academy and some outstanding examples of the work of Academy mem-

bers. It was moved and carried that this committee be authorized to expend sufficient money to cover the expense of arranging the exhibits.

Mr. John S. Wright presented a resolution that the Treasurer pay from the Academy funds not less than \$100.00 nor more than \$200.00 to help with the expenses of the A.A.A.S. for the Indianapolis meeting.

All committee reports were accepted.

Meeting adjourned at 11 p. m.

MINUTES OF GENERAL SESSION

Dean Holl introduced President Winger of Manchester College, who welcomed the Academy. Dr. Edington responded briefly. The minutes of the Executive Committee were read and approved. President Edington announced a Committee on Invitations consisting of O. B. Christy, Chairman; Winona Welch, R. E. Girton, C. M. Palmer, and Theodor Just, and a Committee on Resolutions of James F. Mackell, Chairman; W. J. Tinkle and R. C. Friesner. The scheduled program for the day was then carried out.

A short business meeting followed the dinner, at which 180 were present.

Professor Witmer of the membership committee reported 70 applications for membership. All were elected.

The Resolutions Committee offered the following:

The Indiana Academy now assembled in its fifty-third annual meeting, wishes to express, in this formal way, its appreciation, individually felt by its membership, for the arrangements that have been made for its convenience and have contributed materially to the success of the meetings. It desires to express its special appreciation to President Winger for his generous welcome, to the Faculty, to the Cantilena Choir, to Professor Kintner and his Program Committee for its efficient planning of the meetings, and to the citizens of North Manchester for their hospitality in opening their homes for the comfort of the members.

The Committee on Invitations recommended that the Winter Meeting of the Academy be held at Purdue University in 1938. This recommendation was approved.

The Nominating Committee announced the election of Division Chairmen as follows: *Archeology*, Glenn A. Black; *Bacteriology*, P. A. Tetrault; *Botany*, Floyd E. Beghtel; *Chemistry*, Frank V. Graham; *Geology and Geography*, Stephen S. Visher; *Mathematics*, J. E. Dotterer; *Physics*, Seth Elliott; *Psychology*, A. R. Eikenberry; *Zoology*, H. G. Nester.

The following were nominated for officers for 1938: *President*, Eli Lilly; *Vice-President*, T. G. Yuncker; *Secretary*, William P. Allyn; *Treasurer*, W. P. Morgan; *Editor*, Paul Weatherwax; *Press Secretary*, Will E. Edington.

The Secretary was instructed to cast the unanimous ballot of the Academy for these nominees.

After a few announcements the Academy adjourned.

LOUIS A. TEST, *Secretary*.