

PROCEEDINGS  
*of the*  
Indiana Academy  
of Science

*Founded December 29, 1885*

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VOLUME 48

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PAUL WEATHERWAX, EDITOR

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Field Meeting held at  
McCormick's Creek State Park  
May 13 and 14, 1938

Fifty-fourth Annual Meeting  
Purdue University  
November 3, 4, and 5, 1938

Copies of the Proceedings may be purchased through the secretary of the Academy at  
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**MEMBERSHIP LISTS**—The complete list of members of the Academy was last published in Vol. 46 (1937) of the Proceedings, and supplementary lists appear in following volumes. For the effect that it may have in stimulating activity, a complete list of Junior Academies is published each year as a part of the report on the Junior Academy.

**CONSTITUTION AND BY-LAWS**—The constitution and by-laws of the Academy were last published in Vol. 44 (1935). A codified list of duties of officers and chairmen of committees is published in this volume (pp. xx-xxiv).

**EDITORIAL CODE**—A general editorial code was published in Vol. 44 (1935). Additional directions for the preparation of manuscripts have been printed in leaflet form, and copies of this may be secured from the Editor.

Membership lists and copies of the constitution and by-laws may be secured from the Secretary.

## OFFICERS AND ELECTED COMMITTEES FOR 1938

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### OFFICERS

- President*, ELI LILLY, Eli Lilly and Company.  
*Vice-President*, T. G. YUNCKER, DePauw University.  
*Secretary*, WILLIAM P. ALLYN, Indiana State Teachers College.  
*Treasurer*, W. P. MORGAN, Indiana Central College.  
*Editor*, PAUL WEATHERWAX, Indiana University.  
*Press Secretary*, WILL E. EDINGTON, DePauw University.  
*Trustees Academy Foundation*, JOHN S. WRIGHT, Eli Lilly and Company,  
F. B. WADE, Shortridge High School.  
*Committee for Bonding Trustees*, H. L. BRUNER, Butler University, W. A.  
COGSHALL, Indiana University.  
*Research Committee*, A. L. FOLEY, Chairman, Indiana University (Term  
expires 1941), E. G. MAHIN, University of Notre Dame (Term expires  
1942), H. E. ENDERS, Purdue University (Term expires 1940),  
RAY C. FRIESNER, Butler University (Term expires 1939), JOHN S.  
WRIGHT, Indianapolis (Term expires 1938), ELI LILLY, Indianapolis  
(ex officio), WILLIAM P. ALLYN, Indiana State Teachers College (ex  
officio).

### DIVISIONAL CHAIRMEN

- Archeology*, GLENN A. BLACK, 815 Oakland Ave., Indianapolis.  
*Bacteriology*, P. A. TETRAULT, Purdue University.  
*Botany*, FLOYD E. BEGHTEL, Evansville College.  
*Chemistry*, FRANK V. GRAHAM, Ball State College.  
*Geology and Geography*, STEPHEN S. VISHER, Indiana University.  
*Mathematics*, J. E. DOTTERER, Manchester College.  
*Physics*, SETH ELLIOTT, Butler University.  
*Psychology*, A. R. EIKENBERRY, Manchester College.  
*Zoology*, H. G. NESTER, Butler University.

### EXECUTIVE COMMITTEE

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

Allen, W. P.; Andrews, F. M.; Arthur, J. C.; Beghtel, F. E.; Behrens, C. A.; Black, G. A.; Blanchard, W. M.; Blatchley, W. S.; Bruner, H. L.; Burrage, S.; Cogshall, W. A.; Coulter, Stanley; Cumings, E. R.; Davis, J. J.; Deam, C. C.; Dotterer, J. E.; Edington, W. E.; Eikenberry, A. R.; Elliott, Seth; Enders, H. E.; Foley, A. L.; Friesner, R. C.; Gingery, W. G.; Girton, R. E.; Graham, F. V.; Guernsey, E. Y.; Hessler, R.; Lilly, Eli; Lyon, M. W., Jr.; Mahin, E. G.; Martin, E. S.; Montgomery, B. E.; Morgan, W. P.; Moenkhaus, W. J.; Mottier, D. M.; Nester, H. G.; Noyes, W. A.; Payne, F.; Ramsey, R. R.; Rettger, L. J.; Tetrault, P. A.; Visher, S. S.; Wade, F. B.; Wallace, F. N.; Weatherwax, Paul; Wright, J. S.; Yuncker, T. G.

## STANDING COMMITTEES

(Appointed by the President, chairman of each committee named first.)

**Archeological Survey:** E. Y. Guernsey, Eli Lilly, W. N. Logan, Glenn A. Black, C. A. Malott, R. E. Esarey, C. F. Voegelin.

**Auditing:** E. S. Martin, William Johnson.

**Biological Survey:** B. E. Montgomery, Winona Welch, C. M. Palmer, S. R. Esten, M. W. Lyon, B. H. Smith.

**Library:** Walter G. Gingery, Ray C. Friesner, Nellie M. Coats.

**Membership:** R. E. Girton, S. W. Witmer, Floyd E. Beghtel, M. S. Markle, L. J. Rettger, Glenn W. Giddings, G. D. Klopp, O. B. Christy, W. D. Thornbury, R. E. Martin, Francis J. Wenninger, A. R. Bechtel, C. A. Deppe, Howard H. Helman, F. R. Elliott, William J. Tinkle, Henry G. Nester, Leslie I. Steinbach, D. L. Harmon, H. M. Powell.

**Program:** J. J. Davis, R. B. Abbott, R. H. George, H. H. Remmers, C. A. Malott, Glenn A. Black, Ray C. Friesner, C. K. Robbins, Theodore Just, R. E. Martin.

**Publications of Proceedings:** Paul Weatherwax, J. J. Davis, C. A. Behrens, F. B. Wade, M. E. Hufford, E. S. Conklin.

**Relation of Academy to State:** F. N. Wallace, J. S. Wright, Stanley Coulter, E. Y. Guernsey, Harry J. Reed, D. A. Rothrock.

**Representative on A.A.A.S. Council:** Howard E. Enders.

**Nominations:** Will E. Edington, J. J. Davis, Ray C. Friesner.

**Junior Academy of Science:** Howard E. Enders, F. B. Wade, O. B. Christy, W. P. Allyn, Fred J. Breeze, C. F. Cox.

## MINUTES OF COUNCIL MEETING

### INDIANAPOLIS, MARCH 5, 1938

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The Executive Council meeting at the Indianapolis Athletic Club, held primarily to consider problems pertinent to the spring meeting and other current business needing attention before the regular meeting, was called to order by President Lilly at 1:30, following a luncheon. Twenty-five members of the committee were present: W. P. Allyn, F. E. Beghtel, C. A. Behrens, G. A. Black, W. M. Blanchard, H. L. Bruner, W. A. Cogshall, Stanley Coulter, J. J. Davis, J. E. Dotterer, W. E. Edington, A. R. Eikenberry, Seth Elliott, W. G. Gingery, R. E. Girton, F. V. Graham, Eli Lilly, E. S. Martin, W. P. Morgan, D. M. Mottier, H. G. Nester, P. A. Tetrault, S. S. Visher, Paul Weatherwax, T. G. Yuncker.

The minutes of the previous business meeting, at Manchester College, November 4, 1937, were read and approved with two minor corrections. The reference made to the Treasurer's report was corrected to read that the Treasurer submitted a brief report, and the name of W. P. Allyn was added to the list of fellows elected.

Officers and committees reported as follows:

**Auditing Committee.** E. S. Martin stated that the Treasurer's books at the last audit were in excellent condition. No audit has been made for the current year, since the fiscal year ends December 31.

**Treasurer's Report.** W. P. Morgan briefly indicated the financial status of the Academy to date with a balance of \$810.01.

A discussion followed as to the advisability of transferring some of the balance to the research fund, but action was postponed until the regular fall meeting.

**Editor.** Dr. Weatherwax spoke briefly on the status of the Proceedings for 1938, stating that it was ready to go to press, also that an attempt was being made to publish abstracts of all papers not published in full. He asked the Council to appropriate \$300 to supplement the \$1,000 contributed by the state for publishing and binding the Proceedings.

The appropriation was approved.

A bill for \$1,000 due the publishers of the 1937 Proceedings was brought up for discussion. Due to a minor discrepancy, the lack of the official o. k. of the Editor, this bill had not been paid. It was voted that the matter be placed entirely in the hands of Mr. F. N. Wallace, Chairman of the Committee on the Relations of the Academy to the State, for the execution of necessary proceedings for payment of the bill.

**Program Committee.** J. J. Davis reported that the Committee had decided on McCormick's Creek State Park as the place for the spring meeting and that two tentative dates from which to choose were sug-

gested, May 13 to 14 and May 20 to 21. It was voted that McCormick's Creek State Park be selected as the place and that May 13 and 14 be approved as the date.

**New Business.** Acting upon the previous suggestion of Professor Kintner, President Lilly appointed a committee of three, Dr. Edington, Dr. Friesner, and J. S. Wright, as an advisory committee on duties of Academy officers and committee chairmen. The function of this committee is to formulate suggestions and helps for the committee chairmen, divisional chairmen, and other officers in the performance and integration of the duties of their respective offices.

President Lilly expressed his appreciation for the attendance of the members of the Council, especially during such inclement weather, and begged that they be his guests at the luncheon. A vote of hearty appreciation of his hospitality followed, and the meeting was adjourned.

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## MINUTES OF THE SPRING MEETING

### MCCORMICK'S CREEK STATE PARK

### MAY 13 AND 14, 1938

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The members of the Academy assembled in the Lounge Room of Canyon Inn at McCormick's Creek State Park for the annual spring meeting. The meeting was called to order by President Eli Lilly, who welcomed those in attendance and thanked the members of the Program Committee and other officers concerned for their splendid cooperation in preparing for the meeting.

An informal program followed. Dr. Clyde A. Malott shared with the Academy his store of knowledge on "The Setting and Geological Features of McCormick's Creek Park Area." Dr. A. C. Kinsey's discussion on the "Pleistocene Glaciation Effects on Indiana Fauna and Flora" challenged certain scientific concepts concerning species variation in this area. Dr. Paul Weatherwax discussed "Plants Rare and Common in McCormick's Creek Park Area." Dr. Marcus Ward Lyon, Jr., submitted a tribute to the memory of the splendid work of the late Dr. Bebb.

President Lilly appointed the following Nominating Committee for 1938: Will Edington (chairman), J. J. Davis, and Ray C. Friesner.

The evening meeting was then adjourned.

Several trips were planned for Saturday morning, May 14, but rain interfered with the greater part of the program.

(Signed) WILLIAM P. ALLYN, *Secretary.*

# PROGRAM OF THE WINTER MEETING

PURDUE UNIVERSITY  
NOVEMBER 3-5, 1938

## THURSDAY, NOVEMBER 3

- 7:00-9:00 p. m. Registration.  
7:30 p. m. Meeting of the Executive Committee.

## FRIDAY, NOVEMBER 4

- 8:00-12:00 a. m. Registration.  
9:30 a. m. General Session.  
Address of Welcome—Professor F. C. Hockema, Assistant to the  
President of Purdue University.  
Response—President Eli Lilly.  
Business Session.  
Necrology—Dean Stanley Coulter.  
Sister Amata  
Charles Brossman  
William Bebb  
Kate G. Bitting  
Fred Donaghy  
Joseph P. Naylor  
“The life and work of Joseph Charles Arthur.”—Frank D. Kern,  
Pennsylvania State College.  
“A tribute to Dean Stanley Coulter.”—Ray C. Friesner, Butler  
University.  
“Indiana Mastodons.”—Marcus W. Lyon, Jr., South Bend.  
“Marihuana.”—B. H. Smith, Indiana State Teachers College.  
“The distribution of corn, oats, and wheat in Indiana.”—S. S.  
Visher, Indiana University.
- 1:00 p. m. Sectional meetings. See: archeology, p. 12; bacteriology,  
p. 33; botany, p. 44; chemistry, p. 74; geology and geography,  
p. 113; mathematics, p. 157; physics, p. 171; psychology, p. 183;  
zoology, p. 200.
- 6:00 p. m. Annual Dinner.  
Business Session.
- 8:00 p. m. “Bubbles Concerto—A film fantasy.”—Eiffel G. Plasterer  
and party, Huntington.  
President’s Address—“A plan for accomplishing more effective  
research.”—Eli Lilly, Indianapolis.

## SATURDAY, NOVEMBER 5

- 9:00 a. m. Meeting of entomologists—Chairman, Philip Luginbill, U. S.  
Department of Agriculture. See p. xxviii.  
Meeting of plant taxonomists—Chairman, Ralph M. Kriebel,  
Soil Conservation Service. See p. xxviii.  
Junior Academy of Science. See p. xxv.
- 1:00 p. m. Junior Academy of Science.

# MINUTES OF THE EXECUTIVE COMMITTEE

NOVEMBER 3, 1938

The meeting was called to order at 7:30 by President Lilly. The minutes of the Executive Council at Indianapolis, March 5, 1938, and also those of the spring meeting, held at McCormick's Creek State Park, were read by the Secretary and approved.

Officers and committees gave the following reports:

**Academy Foundation.** John S. Wright, in the absence of Chairman Frank B. Wade, gave the following report as of November 1, 1938:

## Receipts

Balance from previous year.....	\$ 352.01
Total receipts .....	760.57
Total .....	\$1,112.58

## Expenditures

No expenditures .....	000.00
Balance in Indiana National Bank.....	\$1,112.58

## Present Assets at Par Value

United States Treasury Bonds.....	\$4,700.00
Consolidated Federal Farm Loan Bonds.....	1,500.00
Muncie Masonic Temple Association Preferred Stock.....	200.00
Standard Oil Co. of Indiana Common Stock.....	150.00
Total invested assets at par.....	\$6,550.00
Balance in bank (awaiting investment).....	1,112.58
Grand total assets.....	\$7,662.58

**Archeological Survey.** Mr. Guernsey gave an informal report of the activities of the committee for 1938, this being a continuation of work of the previous year with emphasis on studies in southern areas of Indiana.

**Auditing Committee.** Mr. Martin stated that, since the Academy year closed December 31, no audit was yet available for 1938. The Auditing Committee, however, had examined the books of the Treasurer and found that his report appearing in Volume 47 of the Proceedings was a true statement of receipts, expenditures, and balance on hand for the Academy.

Also the books of the Trustees of the Academy Foundation Fund were found to be correct and to agree with the report given by the trustees in Volume 47 of the Proceedings.

**Biological Survey.** B. E. Montgomery submitted the following report:

The committee is pleased to be able to report that Deam's Flora of Indiana has been completed and is in the hands of the printer. Other items of interest, including the bibliography of Indiana biota, are little changed from last year.

The committee wishes again to call attention of the Academy to the urgent need for a research museum within the state. It is hoped that the special committee authorized last year on the recommendation of our committee will be able to report progress on the preliminary steps for such museum.

**Bonding Committee.** Dr. H. L. Bruner, who was unable to be present, submitted a written report to the effect that the premium of \$15.00 on the bond for the Treasurer and Trustees of the Academy was due.

Payment of the bill was authorized.

**Editor.** Dr. Weatherwax, Editor, reported that Volume 47 was delivered to the State Library in August. The details pertaining to the publication of the volume are as follows:

Number of copies printed .....	1600
Number of pages printed .....	324
Cost of printing and binding.....	\$1,432.22
Cost of reprints furnished gratis to authors.....	58.53
Cost of reprints of necrology and membership list.....	17.70
Editorial assistant .....	180.20
Editor's expenses for postage, envelopes, etc.....	10.00
Total cost of publication.....	1,698.65
Amount paid by the Academy.....	698.65
Total cost per printed page.....	5.24
Net cost per page of manufacture.....	4.41

The net cost per printed page has increased about 10% in the past two years. A part of this is attributed to the new scale of contract prices and a part to the condensation of material on the pages. Random samples indicate that the cost per unit of printed matter has shown no material increase.

Dr. Weatherwax also stated that, so far as possible, abstracts of all papers were published.

It was also asked by Dr. Weatherwax that a stipulated sum to be used in publishing the Proceedings be named by the executive committee. The Treasurer suggested that the financial standing of the Academy would permit an expenditure equal to that of last year for publishing the Proceedings.

An amended motion, to the effect that the amount to be spent on the publication of the Proceedings for 1938 be left to the discretion of the Editor and the Treasurer, provided that it did not exceed \$600, was passed.

The expenditure of an amount not to exceed \$200 for editorial assistance was authorized.

**Library Committee.** W. G. Gingery read the following report prepared by Miss Nellie Coats of the State Library:

Since the last annual report 25 new titles, a list of which is appended, have been added to the number of serials received by the Library, making a total of about 300, representing material from 39 states, the Philippines and Hawaii, and 37 foreign countries. An effort is made not only to acquire material representing various scientific fields but to extend the geographic range as widely as possible. We hope to acquire material from such states as are not represented, if material is available, and to expand the foreign mailing list. The foreign countries now represented are: Argentina, Australia, Austria, Belgium, Borneo, Brazil, Canada, Chile, China, Czechoslovakia, Denmark, Dutch East Indies, England, Finland, France, Germany, Greece, Hungary, India, Ireland (Northern), Italy, Japan, Latvia, Mexico, The Netherlands, Norway, Peru, Poland, Portugal, Roumania, Russia, Scotland, South Africa, Sweden, Switzerland, Ukrania, and Uruguay.

Recently the new edition of the National Research Council Handbook of Scientific and Technical Societies and Institutions of the United States and Canada and the 1937 Index Generalis were checked for names and addresses of additional scientific societies and institutions with which it might be profitable to establish the exchange of publications, and letters have been sent to 52 societies and universities asking that such an arrangement be made.

In May, 1938, a letter was received from the National Library of Peiping, China, which we quote:

"Owing to Japan's military occupation of Peiping, we have established an office in Hongkong. We have been collecting books and journals in order to meet the intellectual needs of Chinese scholars in this hour of distress. As many of our universities and scientific institutions have been deliberately destroyed by Japanese militarists, the need of scientific literature felt by Chinese scholars is most urgent.

"Cognizant of your intellectual sympathy for China, we earnestly hope that you will find it possible to send us a set of the following publications issued by your Academy: Transactions, other publications which you distribute to cultural institutions.

"If you would kindly comply with our request, your courtesy will be gratefully appreciated.

"As we have to start our work entirely afresh, we shall greatly appreciate your assistance if you could send us also your duplicate material which you no longer wish to keep.

"Donations of books from your Academy will temporarily be kept in Hongkong and will be properly catalogued and made immediately available for use. As scientific work is being carried on in China despite of the war, your publications will render a great service to the present and future generations of scientific workers in this country.

"In order to save you the trouble of posting your publications to China, we may suggest that you forward them to the International Exchange Service, Smithsonian Institution, Washington, D. C., which would arrange their shipment to us at our Hongkong address. The current issues of your serial publications, however, should be sent by mail so that Chinese scholars will be able to keep in touch with your scientific work.

"Thanking you in anticipation for your cooperation and assistance, I remain

"Very truly yours,

"(Signed) T. L. YUAN, *Acting Director.*"

The following year books were sent in response to this request: 1887, 1889, 91, 93-1913, 1915, 1919, 1924, 1927, 1930, 1931, 1935-37,

The work of checking titles for entry in the Union list of serials in Indiana libraries, sponsored by the College Reference Librarians of Indiana, is nearing completion, and the list should be ready for publication within the year. It is thought that inclusion in this list will greatly add to the library's usefulness.

With the Academy's appropriation of a sum for binding for the years 1937-38 and 1938-39 it is hoped that most of the complete files will be bound during this two-year period. Late in 1937, 445 volumes of serials, chiefly publications of foreign scientific organizations, were bound, and it is estimated that about as many volumes are now ready for binding. These will be prepared and sent to the bindery in the very near future. There will remain the task of filling in incomplete files and binding material received each year. Every effort has been made to secure missing numbers by gift or exchange from the issuing societies or institutions, and it is fairly evident that volumes now remaining incomplete can only be completed by the purchase of the missing numbers if that is considered advisable.

### Titles Added to the Library Since 1937

- Association canadienne française pour l'avancement des sciences *Annales* v. 1, 1935.
- Archives néerlandaises de phonétique expérimentale v. 4, 1929.
- Athens. University. Zoological institute and museum *Acta* v. 1, 1935.
- Australian zoologist v. 1, 1914.
- La bonne terre. Ecole supérieure d'agriculture v. 19, December, 1937.
- Chicago naturalist. Chicago academy of science v. 1, 1938.
- Condor v. 40, 1938.
- Fysiografiske sällskapets. Lund, Sweden. *Forhandlingar* v. 6, 1936.
- Harvard university. Museum of comparative zoology *Bulletin* v. 78, 1935.
- Hawaii. University Research publications no. 8, 1933.
- Instituto pan-americano de geografía e antropología e americano *Boletín bibliográfico de antropología americano* v. 1, 1937.
- London. Science museum. Science Library. *Weekly bibliography* May, 1937.
- Missouri academy of science *Proceedings* 1934-35.
- New Orleans academy of science *Abstracts of papers* 1938.
- Northwest science. Northwest scientific association v. 1, 1927.
- Rivista de biologia coloniale. Rome v. 1, 1938.

- Royal Ontario museum of zoology Contributions 1, 1935.  
 Royal zoological society of New South Wales Proceedings 1935-36.  
 Saratov. Universität Abhandlungen: Chemische serie 1, 1936.  
 Saratov. Universität Geologisch-bodenwissenschaftlichen serie 1, 1937.  
 Scripps institution of oceanography Contributions n. s. 1, 1937.  
 Shanghai science institute Journal 1933.  
 Societas pro fauna et flora Acta v. 58, 1935-36.  
 Yale entomologique de Belgique Bulletin et annales v. 75, 1935.  
 Societe university. School of forestry Bulletin no. 43, 1936.

**Membership Committee.** R. E. Girton, Chairman, stated that 55 applications for membership in the Academy were obtained for the fall meeting. To this list should be added seven other names of those elected at the spring meeting.

It was suggested that all members of the Academy should be on the alert for prospective new members in order that the membership may show a positive growth during the years to come.

**Press Secretary.** Dr. Edington gave the following summary of the activities of his office:

Reports of the Spring Meeting of the Academy were sent to the Indianapolis papers and to the Editor of *Science*. Reports of the present meeting have appeared in the Indianapolis papers and in papers elsewhere. The Indianapolis News carried an editorial in its issue of November 2, commenting favorably on the work of the Academy and the scientists of the State. Since clipping service is not available, the Press Secretary has no means of ascertaining how extensive over the State the Academy publicity may be. Abstracts of most of the papers to be presented before the Academy have been received, and it is planned that stories on some of them will be released on the day of the presentation of the papers.

**Relations of the Academy to the State.** Frank N. Wallace stated that his committee had made a request for \$1,500 from the state, the same amount as that granted last year, for the publication and binding of the Proceedings—\$1,000 for publication of Proceedings and \$500 for binding Proceedings and other manuscripts and records belonging to the Academy.

**Research Committee.** Dr. Foley gave a brief report of grants made for 1938 but stated that no application for future grants had been received by the committee.

The committee awarded \$75 to S. S. Visher, Indiana University, for clerical help in the analysis of climatological data and for traveling expenses to meteorological stations of the state.

A grant of \$125 was awarded to Dr. W. M. Blanchard, DePauw University, to continue studies of new methods for synthesizing derivatives of mandelic acid, investigations on the composition of certain vegetable oils, and preparation of ozetidine derivatives.

It was proposed by the committee when the grants were made that \$150 of the total sum be furnished by the research grant from the A.A.A.S. to the Academy, and the remaining \$50 be paid from the funds of the Academy. It was reported that \$150 had been received from the A.A.A.S. and that both grants, as indicated, had been paid in full to the grantees.

The Chairman stated that reports on the progress of the research work had been received from Dr. Visher, but that, on account of illness, no report had been received from Dr. Blanchard.

**Treasurer.** Dr. W. P. Morgan submitted a tentative report to cover the period from January 1 to October 31, 1938. The following report for the fiscal year, ending December 31, 1938, was later submitted:

**Receipts**

Balance on hand January 1, 1938.....	\$810.01
Dues and Initiation fees.....	856.00
A. A. A. S. refund for research grants.....	150.00
Sale of Proceedings.....	21.32
Sale of separate numbers of journals.....	4.25
Return of unused research grant (Martin).....	1.40
Authors' reprints, Volume 46.....	4.89
Authors' reprints, Volume 47.....	293.57
Bequest from estate of Dr. Stoltz.....	40.00
	\$2,181.44

**Disbursements**

Program Committee .....	\$126.00
Expenses of Editor.....	207.50
Expenses of Secretary.....	80.78
Expenses of Treasurer.....	47.00
Mailing Proceedings .....	95.52
Stationery .....	55.35
Indianapolis Engraving Co.....	183.25
Wm. B. Burford Printing Co.....	783.63
Junior Academy, Science club bulletins.....	20.00
Surety bond and safety deposit box.....	20.50
Expenses local committee, A. A. A. S. meeting.....	31.81
Payment of Stoltz bequest to Foundation.....	40.00
Research grants (Wilson, \$75; Blanchard, \$125; Visser, \$75.00).....	275.00
Returned check.....	4.02
Bank service charge .....	.50
Expense refund to officers and chairmen.....	12.15
	\$1,983.01
Bank balance .....	198.43
	\$2,181.44

The balance indicated above as carried forward from 1937 is \$1.00 more than that published in the preceding annual report, due to a loss of a check for \$1.00 by an officer. This is covered by a duplicate listed under the last in the above list of disbursements.

(Signed) W. P. Morgan, *Treasurer.*

Ersie S. Martin, *Auditor.*

Wm. Johnson, *Auditor.*

**Junior Academy Committee.** Dr. Enders reported that to date there are about forty active junior organizations and several prospective clubs under consideration. A mailing list and visitation itinerary have been established in order to familiarize the high schools of the state and capture their interest with this phase of the Academy's program.

It was emphasized that exhibits of the Junior Academies would be on display Saturday morning and that it would be not only interesting to visiting members of the Academy but also stimulating to the Junior Academy representatives if they were honored by the attendance of members of the senior Academy.

At the suggestion of Dr. Enders, it was voted to appropriate \$20 again this year for the cooperative publication, with the Illinois Academy, of the Science Club Service to be distributed among the Junior Academies and prospective clubs.

**Nominating Committee.** Dr. Joseph Charles Arthur was nominated as Honorary Fellow, and the following were nominated as Fellows: F. E. Beghtel, Ralph Kriebel, W. D. Thornbury, F. V. Graham, and B. H. Smith. H. L. Bruner and W. A. Cogshall were nominated to succeed themselves on the Bonding Committee, and John S. Wright to succeed himself on the Research Committee, his term to expire in 1943.

All the above nominees were elected. The nominations of other officers of the Academy were withheld until the dinner meeting.

**Necrology.** Dean Coulter, who has for many years collected data for the necrology, requested that this duty be assigned to a younger man with close acquaintance with the membership and affairs of the Academy. It was voted that this duty be assigned to Dr. Will E. Edington until a change was officially designated.

**Relation of High School Teachers to the Academy.** Means of encouraging high school teachers to attend the Academy were discussed. Dr. Edington stated that the permission for teachers to be absent from duty in order to attend the Academy meetings lay entirely in the hands of local school officials and that, through local science clubs, school officials might be encouraged to recognize the value of these meetings and to cooperate.

It was voted that a committee be appointed to acquaint school officials with the program of the Academy and to enlist their cooperation in the participation of teachers in Academy programs.

**Program Improvement.** It was decided in 1937, at the suggestion of a special committee under Dr. Friesner, that papers of special merit read before the Academy be selected by the Research Committee and given honorable mention at the dinner meeting following the sectional meetings.

Dr. Foley, Chairman of the Research Committee, asked that this be omitted this year and indefinitely until satisfactory machinery could be organized for handling this problem. He stated that the magnitude of the job and brevity of time during the course of meetings presented a physical impossibility. Dr. Foley's request was granted. It was suggested that honorable mention of worthy papers might be made at the first succeeding annual meeting.

**Correlation of Duties of Officers.** Dr. Edington, as Chairman, reported that the special committee on duties of officers, which had been authorized by the Council at its meeting in March, had practically completed its work. He gave a brief resume of what had been accomplished and asked that the completed report be mimeographed for immediate use and also published in the Proceedings and that reprints be prepared for distribution to officers in the future. The report was approved, and its publication was authorized. (The codified list of duties of officers is published in full on pages xx to xxiv.)

President Lilly appointed the following committees: *Invitations*—L. A. Test, Glenn A. Black, and O. B. Christy; *Resolutions*—C. A. Malott, Paul Weatherwax, and B. E. Montgomery.

The meeting adjourned at 10:30 p. m.

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## MINUTES OF THE GENERAL SESSION

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The meeting, with 433 registrations, was called to order at 9:30 a. m. in Eliza Fowler Hall by President Lilly. An address of welcome was given by Professor F. C. Hockema, Assistant to the President of

Purdue University. President Lilly responded briefly to the welcome and expressed the appreciation of the Academy for the hospitality extended by the University.

In the brief business session which followed, the action of the Executive Committee was approved. J. J. Davis, Chairman of the Program Committee, commented briefly on minor changes which had been made since the printing of the program.

Dean Coulter paid appropriate tribute to the memory of six members of the Academy whose deaths had occurred during the past year: Sister Amata, Kate G. Bitting, Charles Brossman, William Bebb, Fred Donaghy, and Joseph P. Naylor.

The meeting adjourned at 11 o'clock, a. m., and the sectional meetings convened at one o'clock.

The annual Academy dinner was held in the Purdue Union Building at 6 p. m. A short business meeting followed the dinner. Dr. Girton, Chairman of the Membership Committee, submitted the names of 54 applicants for membership, and all were elected.

The Resolutions Committee offered the following resolution:

The Indiana Academy of Science, assembled at Purdue University in its fifty-fourth annual meeting, expresses its sincere appreciation for the hospitality offered by the University, for the careful preparations made by its Program Committee under the leadership of Professor J. J. Davis, for the efficiency and interest demonstrated by its officers, and for the presence of a large number of its membership, who demonstrate their interest in the progress of science in Indiana by their presence and participation in the programs.

The Committee on Invitations recommended that the Academy accept the invitation of the Indiana State Teachers College to be the host for the Academy at its next annual winter meeting, 1939. The recommendation was approved.

The Nominating Committee announced the election of the Division Chairmen as follows: *Archeology*, Paul Weer, Indianapolis; *Bacteriology*, W. A. Jamieson, Eli Lilly and Company; *Botany*, Winona Welch, DePauw University; *Chemistry*, Herman T. Briscoe, Indiana University; *Geology and Geography*, Thomas M. Bushnell, Purdue University; *Mathematics*, P. D. Edwards, Ball State Teachers College; *Physics*, R. B. Abbott, Purdue University; *Psychology*, F. B. Knight, Purdue University; *Zoology*, C. P. Hickman, DePauw University.

The following were nominated for officers for 1939: *President*, T. G. Yuncker, DePauw University; *Vice-President*, L. A. Test, Purdue University; *Secretary*, W. P. Allyn, Indiana State Teachers College; *Treasurer*, W. P. Morgan, Indiana Central College; *Editor*, Paul Weatherwax, Indiana University; *Press Secretary*, W. E. Edington, DePauw University. It was voted that the Secretary be instructed to cast a unanimous vote for the election of these nominees.

The meeting was then placed in charge of the new President, and Retiring President Lilly delivered a very interesting and thought-provoking address on "A Plan for Accomplishing More Effective Research."

Entertainment followed and the meeting was adjourned.

(Signed) W. P. ALLYN, *Secretary*.

## DUTIES OF OFFICERS

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The following list of duties of officers and committee chairmen of the Academy was prepared by a special committee, consisting of Will E. Edington (Chairman), John S. Wright, and Ray C. Friesner, and approved by the Executive Committee at the Winter Meeting of 1938.

### President

1. To preside at all meetings of the Academy except when relieved by the Vice-President.
2. To appoint the members of the standing committees and any special committees. To appoint the members of the Nominating Committee, Invitations Committee, and Resolutions Committee. It is suggested that the Nominating Committee be chosen from past presidents.
3. To approve the current bills of the Academy.
4. To deliver an address, known as the Presidential Address, at a time specified by the Program Committee.
5. To cooperate closely with the Committee on Relation of the Academy to State in the securing of funds for the publication of the Proceedings, library improvements, and similar projects.
6. To call special meetings of the Council or Executive Committee as occasion demands. A special Council Meeting is generally held in late February or early March in order to make general plans for the year.
7. To perform other such duties as pertain to the office.

### Vice-President

1. To preside in the absence of the President and otherwise at the request of the President.
2. To preside and introduce the President at that session or that part of the session at which the President makes his Presidential Address.
3. To perform other such duties as usually pertain to the office.

### Secretary

1. To keep the minutes of the meetings of the Council, the Executive Committee, and of all General Sessions of the Academy, and to prepare these minutes for publication in the Proceedings. The form in which these minutes should appear may be found in past volumes of the Proceedings. The minutes of the Executive Committee just preceding the General Winter Meeting should be prepared for reading at the General Meeting the following morning. Also the nominations for fellows of the Academy should be presented at this General Meeting.
2. To furnish the President or other officers complete copies of the minutes or such parts as they may specifically request.
3. To notify promptly the President and Committee Chairmen of any items in the minutes which they should know or which require their action.
4. To keep a complete file of the membership of the Academy as furnished by the Treasurer, and to have charge of the mailing lists of all Academy notices and the Proceedings, and to supply such lists upon request to the Chairman of the Program Committee and the proper officials of the State Library.
5. To notify the Chairman of the Program Committee that, upon his request, addressed envelopes will be supplied him for mailing:
  - a. Preliminary Spring Meeting notices, these to be window envelopes and to include addressed dues notices, the amounts to be filled in by the Treasurer.
  - b. Final Spring Meeting notices.
  - c. Preliminary Winter Meeting notices.
  - d. Final winter program.

6. To address dues notices for Treasurer upon his request. When a new treasurer is elected, to inform him of this service.
7. To address envelopes for Chairman of the Program Committee. Three sets are needed: one for final Spring Meeting announcement, one for preliminary Winter Meeting announcement, and one for final Winter Meeting announcement. Preliminary Spring Meeting announcements go out in window envelopes containing also the dues notices. Final notices of meetings are sent to non-resident members.
8. To address labels for mailing out Proceedings to active members. Check slips against "dues paid" for years for which Proceedings are current. Those who have not paid dues receive no Proceedings. Non-resident members who pay no dues do not receive the Proceedings.
9. To prepare membership roll after the Winter Meeting. Make at least two copies and send one copy to the Editor and keep one copy in reserve.
10. To keep on file statements as to the duties and modes of procedure of the Chairman of the Program Committee, the Chairman of the Research Committee, and the chairmen of the divisions, and to inform these various chairmen of their respective duties in sufficient time preceding the meetings. See duties of these officers.
11. To secure Academy stationery. For amounts and those to whom it goes see yearly card records filed with minute book.
12. To notify all new members of their election. Use form cards.
13. To send notices to all members elected as Fellows or Honorary Fellows or otherwise honored. Send notices to all newly elected officers who were not present when election was held.
14. To send copies of all resolutions to persons concerned.
15. To send the new President a list of all old committees with suggestions regarding new committees.
16. To send out lists of committees to all members of committees as soon as they are appointed by the new President. Include a note informing chairmen that reports will be expected at the Winter Meeting.
17. To notify all members of Executive Committee of all meetings of this committee. The Executive Committee consists of present officers, past presidents, chairmen of standing committees, and divisional chairmen. Notify them one month before Winter Meeting and remind them of written reports due at the Winter Meeting.
18. At the request of the President, to notify all members of the Council concerning meetings of the Council. The Council is composed of the officers of the Academy.
19. To inform the Chairman of the Nominating Committee one month preceding the Winter Meeting that the nominations of Fellows and Honorary Fellows must be presented at the Executive Committee Meeting.
20. To correct membership file whenever changes of address occur. Change must also be made on addressograph stencil. Destroy old stencil, and type card for the new one. Send cards to Elliott Addressograph Company, Indianapolis, for stencils twice annually, about January 1 and August 1. Inform Treasurer of all changes of address as they come.
21. All current bills of the Academy must be approved by the Secretary and the President before they are paid by the Treasurer. Approval of bills should be given promptly so that, whenever possible, discounts for cash may be secured.
22. Preceding meetings of the Executive Committee, to prepare for the President an order of business and bring to his attention any matters of incomplete business as found in the minutes of the preceding meeting.
23. At all meetings of the Council, Executive Committee, and general Academy, to have available the minute book containing the constitution and by-laws, list of committees and editor's code, and also a copy of the last Proceedings.
24. To perform other such duties as usually pertain to the office.

#### Treasurer

1. To handle all funds of the Academy currently received and not otherwise provided for.
2. To keep the financial records of the Academy, and to pay all bills of the Academy that have been previously approved by the President and the Secretary.
3. To notify the members annually of their standing as to membership dues, and to render statements to members for charges for reprints, etc. At the request of the Treasurer, the Secretary will send to the Treasurer the addressed dues notices, upon which the Treasurer will fill in the proper amounts before sending the notices to the Chairman of

the Program Committee so that the dues notices may be sent out with the preliminary Spring Meeting notices.

4. To inform the Secretary concerning the addition of new members and the dropping of old members for non-payment of dues, so that the membership lists may be kept correct and up to date. The Treasurer should turn over promptly all "dues paid" cards to the Secretary.

5. To receive all refunds from the A. A. A. S., such refunds to be used only for research grants as recommended by the Research Committee and authorized by the Academy.

6. To receive such funds from the Academy Foundation as have been allotted for research grants, and to pay such funds to research grantees as have been recommended by the Research Committee and authorized by the Academy. See Proceedings for 1938, Volume 47, page 10.

7. To prepare tentative and permanent statements showing clearly the financial status of the Academy, and to prepare and have audited a financial statement at the end of the fiscal year for publication in the Proceedings. A tentative statement should be presented at the Winter Meeting of the Executive Committee, and the Treasurer should anticipate receipts and be prepared to advise the officers in matters involving appropriations.

8. To provide the Editor with information concerning the status of members submitting papers for publication.

9. To perform other such duties as may pertain to the office.

#### **Editor**

1. To edit all manuscripts of papers presented on the programs of the Academy which are submitted and accepted for publication in the Proceedings. See statement of editorial policy and editorial code in the Proceedings, Volume 44, page 257.

2. To make such contracts and arrangements as are necessary for the publication of the Proceedings and as are consistent with the accepted policy of the Academy in its cooperation with the state in such publication.

3. To approve all bills arising from the publication of the Proceedings and to send these bills to the President and Secretary for their approval before payment by the Treasurer.

4. To file with the Treasurer statements of all charges for reprints and any other charges incurred by members in the publication of the Proceedings.

5. To publish in each volume of the Proceedings a statement referring to the report on the duties of officers and giving the number of the volume in which it is published.

#### **Press Secretary**

1. To have general charge of the publicity of the Academy and to prepare for the use of college directors of publicity, reporters, and editors such material as will inform the citizens of the state as to the nature of the activities and the purposes of the Academy.

2. To gather photographs, programs, and other material of general and historical interest for the files of the Academy in the State Historical Library.

3. To prepare statements concerning the meetings of the Academy suitable for publication in *Science*.

4. To cooperate with publicity directors of the institution where the Academy may be holding its meetings in the preparation of any publicity which the institution may deem desirable concerning the Academy and its activities. Photographs of officers and outstanding speakers should be secured whenever possible at least one month preceding the Winter Meeting and of new officers immediately following their election.

5. The photograph of each new president and any other outstanding member should be secured and placed in the Academy files in the State Historical Library.

#### **Chairman of the Program Committee**

1. In cooperation with his committee, to choose the place and prepare the program for the Spring Meeting of the Academy.

2. To prepare the general program for the Winter Meeting, and to appoint a local committee on arrangements to assist in the work of preparing for the meeting.

3. To compile the special programs as received from the divisional chairman, and to prepare and have published complete programs of all meetings of the Academy, together with such additional information as may be deemed necessary for the convenience of the members, such as hotel accommodations, road information, transportation facilities, etc.

4. To send to each member of the Academy the programs of the various meetings. The addressed envelopes are to be prepared by the Secretary and forwarded to the Chairman of the Program Committee at the Chairman's request.

5. To have general charge of all arrangements for the meetings of the Academy, such as luncheons, banquets, hotel arrangements, transportation, the providing of lanterns and screens, suitable locations for Junior Academy exhibits, etc.

6. To cooperate with the Academy Committee on the Junior Academy of Science in the making of the plans and arrangements for the meetings of the Junior Academy. The program of the Junior Academy Meeting is published as a part of the program of the Winter Meeting of the Academy.

7. To arrange, if possible, an information system whereby during the division meetings the members of the various divisions may be kept informed as to what papers are being read in the various divisions.

8. To receive the abstracts in triplicate of papers presented on the general program and promptly to send one abstract to the Editor, one to the Press Secretary, and one to the Chairman of the Research Committee.

9. To secure for announcement in the Winter Meeting program, a list of the names of all Academy members who have become deceased during the year, and to cooperate with the Academy necrologist in the preparation of memorials. Write to the Secretary for information.

10. To provide, when considered necessary, maps of the campus or neighborhood in which meetings are held.

11. In planning the menus of luncheons and dinners, to provide, as far as possible, for the special needs of those members who, because of religious or other limitations, may prefer foods other than those ordinarily served.

12. To make special arrangements, when necessary, for the care of colored members of the Academy and the Junior Academy.

13. To cooperate with the Secretary and Treasurer in the sending out of preliminary and final notices of meetings and to have all program material prepared, published, and mailed out at least one week before a meeting.

#### **Divisional Chairman**

1. To preside over the meetings of his division.

2. To appoint a divisional nominating committee who will recommend candidates for the office of divisional chairman for the following year. This does not preclude nominations from the floor.

3. To see that his successor is elected by his division for the next year's meetings of his division, and to report such successor's name to the Chairman of the Nominations Committee immediately after the close of the divisional meeting so that the election of his successor may be confirmed by the Academy in general session.

4. To receive all titles and abstracts of papers submitted for presentation at the divisional meetings and to select the papers for the program of the division. The program is then to be turned over promptly to the Chairman of the Program Committee. Abstracts should be received in triplicate, and one copy of each abstract should be sent to the Editor of the Proceedings, one copy to the Press Secretary, and the third copy to the Chairman of the Research Committee with any comments as to its value for consideration for worthy mention. These abstracts should be sent promptly to the above mentioned officers.

5. It is recommended that the divisional chairman present an address, not to exceed thirty minutes in length, before the forenoon meeting of the division over which he presides.

#### **Chairman of the Research Committee**

1. To have charge of all research projects of the Academy.

2. To receive all applications for research grants, and to report to the Academy all such recommendations as the Research Committee may make.

3. To receive from the divisional chairmen abstracts of all papers to be presented before the various divisional meetings of the Academy, and from the Chairman of the

Program Committee abstracts of papers to be presented at the General Meeting of the Academy. The Research Committee will use these abstracts as an aid in the determination of such papers as may be deemed worthy of honorable mention.

4. To appoint referees or judges in each division, who will report on the relative merits of the papers presented before the division as a final means of determining the paper or papers deemed most worthy of honorable mention for that division.

5. To report at the dinner meeting the names of the authors of the papers considered worthy of honorable mention, as determined by the Research Committee.

#### **Chairman of the Nominations Committee**

1. It is important that the officers of the Academy be members who are sincerely interested in the work of the Academy. They should possess some executive ability and they should be dignified and temperamentally fitted for the positions for which they are nominated. The Chairman of the Nominations Committee should be familiar with the names of past presidents, which may be secured from certain past Proceedings or from the Secretary. The officers to be chosen are President, Vice-President, Secretary, Treasurer, Editor of the Proceedings, Press Secretary, Trustees of the Academy Foundation, and members of Committee for Bonding Trustees. The first six officers are chosen annually. The other officers are chosen only as the terms of incumbent officers expire. The nominations of the first seven officers are made at the dinner meeting or the general session following it. The members of the Committee for Bonding Trustees are appointed by the Executive Committee, and such nominations should be made at the Winter Meeting of the Executive Committee.

2. The Chairman of the Nominations Committee should receive the nominations for Fellows and Honorary Fellows previous to the annual Winter Meeting of the Executive Committee. The Nominations Committee then submits its recommendations to the Executive Committee at the annual Winter Meeting. The maximum number of Fellows that may be elected in any one year is five. Members of the Academy who may have been elected Fellows in the American Association for the Advancement of Science automatically become Fellows of the Academy.

3. Following the close of the divisional meetings, the Chairman of the Nominations Committee will receive from the incumbent chairman of each division the name of the member of that division nominated for divisional chairman for the coming year. The nominations of these divisional chairmen are presented at the dinner meeting, along with the nominations of other officers, by the Chairman of the Nominations Committee.

4. Immediately following the election, the Chairman of the Nominations Committee should file a list of the officers nominated with the Secretary and the Press Secretary.

#### **Chairman of the Invitations Committee**

1. To receive the invitations of institutions desiring to entertain the Academy at its next annual Winter Meeting, and to report the recommendations of the Committee at the dinner meeting.

#### **Chairman of the Resolutions Committee**

1. To prepare resolutions for courtesies extended by host institutions and local committees.

2. To prepare any other resolutions required by the Academy, through special action of the Academy.

3. To present these resolutions at the dinner meeting of the Academy.

4. To file a copy of each resolution with the Secretary.



## JUNIOR ACADEMY OF SCIENCE

### Officers for 1938:

*President:* ELOISE CROSBY, North Side High School, Ft. Wayne.  
*Vice-President:* DONALD FRIER, West Lafayette High School.  
*Secretary:* JAMES BELTZ, Elmhurst High School, Ft. Wayne.

### PROGRAM OF EIGHTH ANNUAL MEETING

November 5, 1938

- 10:00—General session. David Williams, Sciemus Club, Valparaiso, presided.
- 10:30—Bubbles program by Eiffel G. Plasterer and party.
- 11:00—Short papers by members:
- “Photography,” Robert Weiss, Sciemus Club, Valparaiso.
  - “Setting Up a Home Laboratory,” Roy Harlow, Sciemus Club.
  - “Ecology of a High School Nature Preserve,” Grace LaMar and Esther Rainey, Nature Study Club, Technical High School, Indianapolis.
- 11:30—Business session—Election of officers.
- 1:00—Principal address:
- “A College Girl’s Adventures as a Naturalist on the Barren Grounds of the Arctic,” Mrs. Marguerite Baumgartner, East Lansing, Michigan.
- 2:00—Short papers by members:
- “Bee Culture,” Dorothy Barnhart, Science Club, Wabash.
  - “Incubation of American Woodcocks,” Madge Norwood, Science Club, Wabash.
  - “How to Make an Insect Collection,” Evelyn Lachowicz, Biology Club, Lew Wallace High School, Gary.
  - “Sexuality in Thallophytes,” Howard Morris, Science Club, Bloomington.
  - “Commercial Beekeeping,” Jules O. Hendricks, Science Club, Bloomington.
  - “Distillation of Wood,” Ellwood May, Science Club, Mishawaka.
- Other papers.
- Reports on progress of the Indiana Junior Academy of Science in 1938, Dean Howard E. Enders, Purdue University.

## MINUTES OF BUSINESS SESSION

The Indiana Junior Academy of Science held its eighth annual meeting in the Stanley Coulter Hall, Purdue University, November 5, 1938, with David Williams, of the Sciemus Club of Valparaiso High School, presiding.

Officers elected for 1939 were: *President*, Eloise Crosby, North Side High School, Ft. Wayne; *Vice-President*, Donald Frier, West Lafayette High School; *Secretary*, James Beltz, Elmhurst High School, Ft. Wayne.

Mr. J. H. Otto, George Washington High School, Indianapolis, was chosen as successor to G. W. Wade, Crispus Attucks High School, Indianapolis, to serve as a member of the Council from 1938 to 1943. (The other members of the council are: C. O. Pauley, 1934-1939; F. J. Breeze, 1935-1940; Anna Inskeep, 1936-1941; and Lola Lemon, 1937-1942.)

The attendance of members and sponsors totalled 265.

The meeting adjourned at 4 p. m.

DAVID WILLIAMS, *President*,  
MARY PENROD, *Secretary*.

## EXHIBITS

The exhibits were installed early Saturday morning in the General Biology Laboratory, every table in the room devoted to exhibits from the several clubs. Keen interest was manifested by members of the visiting clubs as well as by those who demonstrated their own exhibits.

The following exhibits were prepared:

1. Nature Study Club, Technical H. S., Indianapolis, C. F. Cox, Sponsor: 15 pictures; 4 paintings; 15 herbarium sheets; flower calendar of Nature Preserve.
2. Nature Study Club, North Side, Ft. Wayne H. S., Vesta Thompson and H. S. Michaud, Sponsors: herbarium book; scrap book; moss terrarium; insect collection; potatoes raised as club project.
3. Science Club, Bloomington H. S., M. M. Williams, Sponsor: aeroplane with motor (demonstration).
4. Science Club, Mishawaka H. S., Darl F. Wood, Sponsor: distillation of wood, showing still, etc.; apparatus to liquefy ammonia; sodium atom; burnt wood drawings.
5. Science Club, Lowell H. S., R. J. Brannock, Sponsor: insect collection.
6. Science Club, Wabash H. S., R. D. Black, Sponsor: photomicrographs; snakes; radio actuated by electronic cell (demonstration).
7. West Lafayette High School Science Club, Anna Inskeep, Sponsor: soils; stamp collection; 3 varieties of Bryophyllum; wild flowers (Rocky Mt. Region); crystal oscillator; communications; anatomical plaster paris molds and casts; steps in polishing gems; gems; projects in enlarging photos.
8. Science Club, George Wahington H. S., Indianapolis, J. H. Otto, Sponsor: leaves; rocks; minerals.
9. Geography Council, North Side H. S., Ft. Wayne, F. J. Breeze, Sponsor: large map showing utilization of land along Hayden Rd.

10. Biology Club, Lew Wallace H. S., Gary, Lola Lemon, Sponsor: 12 leaf herbarium books; 7 insect collections.

11. Sciemus Clubs, Valparaiso H. S., C. O. Pauley, Sponsor: static machine (demonstration); aeroplane; polariscope; arc light; light detector; fluorescence under ultra-violet rays.

12. Shortridge Chemistry Club, Indianapolis, Lois Martin, Sponsor: not displayed.

JUNIOR ACADEMIES OF SCIENCE

Town	Club	Date of Affiliation	Sponsor
North Madison	*Hilltop Nature Study Club	1931	A. J. Slaton
Valparaiso	*Sciemus Club	1931	C. O. Pauley
Bloomington	*General Science Club	1931	M. M. Williams
Indianapolis	*Biology Club	1931	C. E. Ransom
Crispus Attucks			
Crawfordsville	*Audubon Society	1931	Emmett Stout
Indianapolis	*Chemistry Club	1931	Lois Martin
Shortridge			
Union City	*Science Club (inactive)	1932	
Indianapolis	*Nature Study Club	1932	C. F. Cox
Technical			
Coesse	*Jolly Hiking and Nature Club	1932	Chas. Luther (No report)
(Whitley County)	Wash. Center Hiking and Nature	1932	(No report)
Anderson	Science	1936	M. J. Brozier
Bloomington		1938	W. B. Miner
University School			
Cambridge City	Tri Science	1934	J. L. Bozarth
East Chicago	Edison	1935	Harry Apostle
Roosevelt			
Ft. Wayne	Phy-Chem	1937	Ruth Wimmer
Elmhurst			
Ft. Wayne	Geography Council	1932	F. J. Breeze
North Side	Science	1936	Vesta Thompson and H. H. Michaud
	Phy Chem	1936	H. A. Thomas
Gary	Biology	1935	Lola Lemon
Lew Wallace			
Gas City	Science	1936	Roy McKee
Greencastle	Science	1936	F. N. Jones
Guilford	Science	1936	
Hammond	Nature Lore	1937	H. J. Bjorklund
Thos. Edison			
Indianapolis	Science	1937	J. H. Otto
Geo. Wash.			
Lowell	Science	1935	C. N. Seeright
Madison		1938	Evans Cottman
Marion	Science	1936	Mrs. Pauline Mayhugh
Mishawaka	Science	1936	Darl F. Wood
Montmorenci	Jr. Acad. of Sci.	1933	I. W. Vance
Mooresville	Science	1936	Fitzhugh Lee
Muncie	Science	1934	F. Kyger
Blaine Jr.			
New Albany	Jr. Acad.	1935	Gladys Knott
Paoli	Science	1935	O. R. Whitlock
Tipton	Jr. Science	1933	W. D. Hiatt
Wabash	Science	1936	R. D. Black
West Lafayette	Science	1933	Anna Inskeep

\*Charter members.

## MEETINGS OF RELATED GROUPS

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Following the precedent of former years, the members interested in entomology and systematic botany held informal meetings at the fall meeting on Saturday forenoon, November 5.

**Entomology.**—The meeting was called to order at 9 o'clock by Philip Luginbill, chairman. Thirty-three attended this session.

Informal discussions took place on various subjects of interest to economic entomologists, such as Corn Earworm Investigations, by E. V. Walter; Cutworm Studies and Corn Borer Investigations, by G. A. Ficht; Forest Insect Investigations, by B. A. Montgomery; Hessian Fly Studies, by Curtis Benton; and White Grub Investigations by Philip Luginbill. All these discussions aroused considerable interest.

The latter part of the period was taken up by G. E. Gould, who showed some films on the development of cockroaches and activities of other insects.

P. T. Ulman, Indiana Department of Conservation, was elected chairman of the group for 1939.

**Taxonomy.**—The meeting of the plant taxonomists was called to order by Ralph M. Kriebel, chairman. About 40 attended the discussion.

The meeting was devoted to a symposium on the concept of the species, the discussion being centered about the following four topics: History of the Concept of the Species, by Theodore Just; The species Problem from the Standpoint of the Taxonomist, by Ray C. Friesner; The Use of the Species Concept in Mycology, by Marion L. Lohman; and The Genetic Interpretation of the Species, by Alfred C. Kinsey.

There was a report on the field trip held in the Kankakee region, September 2-5, 1938, supplemented by Kodachrome slides of photographs taken in the field during the meeting.

It was decided to have another summer field trip in 1939 in southwestern Indiana. Scott McCoy and Chas. C. Deam were appointed as a committee to make arrangements.

Fred A. Loew, Huntington College, was elected chairman for 1939.

## NEW MEMBERS 1938

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- Ackerson, Oscar E., 1711 O Street, Bedford.  
Belcher, Robert Orange, 224 Waldron Street, West Lafayette.  
Betz, Howard T., Valparaiso University, Valparaiso.  
Biefeld, Dr. L. P., Purdue University, Lafayette.  
Brundage, Roy Charles, Agri. Exp. Station, Purdue University,  
Lafayette.  
Bryant, Carl C., 1312 Ferry Street, Lafayette.  
Campbell, Dr. Kenneth Nielsen, 614 N. St. Peter Street, South Bend.  
Cleland, Prof. Ralph Erskine, Indiana University, Bloomington.  
Craig, Johnston C., 515 Lincoln Avenue, Bedford.  
Daily, William A., 3216 Ralston Avenue, Indianapolis.  
Danielson, Gordon Charles, Dept. of Physics, Purdue University,  
Lafayette.  
Duncan, Robert Ferrie, 143 South Grant, West Lafayette.  
Dutro, Miss Ruth, Hagerstown.  
Echelbarger, Garold Hungerford, R. R. 1, Jonesboro.  
Falkenberg, Dr. G. V., Purdue University, Lafayette.  
Fitzgerald, Dr. Dorothea, St. Mary-of-the-Woods.  
Fulwider, C. O., 617 W. Washington Avenue, South Bend.  
Gantz, Dr. Edward S., 106 W. Jefferson Street, Crawfordsville.  
Gasho, Miss Grace Anne, R. R. 2, Atlanta.  
Gault, Hugh Richard, Ravinia, Illinois.  
Geiger, Howard Eugene, Purdue University, Lafayette.  
Hamill, Dr. William H., University of Notre Dame, Notre Dame.  
Hartman, Dr. John D., Purdue University, Lafayette.  
Henion, Miss Ruth E., Purdue University, Lafayette.  
Hilbert, Miss Marguerite, 5868 N. New Jersey Street, Indianapolis.  
Hines, George Ernst, Jr., Ulen Country Club Park, Lebanon.  
Hopp, William Beecher, 1411 Maple Avenue, Terre Haute.  
Hovda, Dr. Olaf, 519 S. Rotherwood Avenue, Evansville.  
Howick, Prof. Harry, 403 N. College Avenue, Muncie.  
Huffman, Mrs. Elna, 122 Waldron, West Lafayette.  
Ignatia, Sister, St. Mary-of-the-Woods.  
Johnson, Dr. David F., Indiana State Teachers College, Terre Haute.  
Kase, John Charles, Purdue University, Lafayette.  
Kent, Robert E., 198 State Street, Franklin.  
Kesling, Robert Vernon, Peru.  
Klinge, Paul Ernest, 3365 N. Colorado Avenue, Indianapolis.  
Koepper, James M., Medora.  
Lee, Hugh B., 1522 S. Center Street, Terre Haute.  
Long, R. E., 604 Harrison Avenue, South Bend.  
Longden, Grafton J., Jr., Broadview Farm, Greencastle.  
Luginbill, Dr. Philip, 107 Fowler Avenue, West Lafayette.

Mauzy, Jack, 218 Pearl Street, Jeffersonville.  
Maxwell, Dr. Roy D., Ball State Teachers College, Muncie.  
Mitchell, Prof. Allan Charles G., Indiana University, Bloomington.  
Murray, Herbert C., 106 W. Lutz Street, West Lafayette.  
Overman, Richard R., Longden Hall, DePauw University, Greencastle.  
Richards, Miss Ruth R., 3935 Graceland Avenue, Indianapolis.  
Ryan, George S., 614 West South Street, Angola.  
Serviss, Prof. Fred LeVerne, 136 East Stadium Avenue, Lafayette.  
Shaw, Thomas Edward, 206 W. Lutz Avenue, West Lafayette.  
Shockley, Clarence Herbert, 924 Woodlawn Avenue, Terre Haute.  
Strickler, Dr. P. M., Indiana Central College, Indianapolis.  
Summers, S. D., 514 W. Prospect, Angola.  
Templeton, Miss Margaret, 898 E. Jefferson Street, Franklin.  
Terry, Robert Lee, 6536 Irving Avenue, Merchantville, New Jersey.  
Thomas, Dr. Ancil R., 831 Laporte Avenue, Valparaiso.  
Thomas, H. Rex, Purdue University, Lafayette.  
Thrun, Dr. Walter E., Valparaiso University, Valparaiso.  
Tussing, Lyle, 619 Salisbury, West Lafayette.  
Uyl, Prof. Daniel Den, Purdue University, Lafayette.  
Van Camp, John Lloyd, 226 Lincoln Street, West Lafayette.  
Wear, Robert Eugene, Purdue University, Lafayette.  
Weimer, Dr. Harry Raymond, Manchester College, North Manchester.  
White, Francis M., 6529 Woodlawn Avenue, Chicago, Ill.  
Whitmore, Robert, Zionsville.  
Wright, Dr. William Lee, 208 E. 46th Street, Indianapolis.

#### NEW JUNIOR CLUBS 1938

Junior Academy Club of University School, Indiana University,  
Bloomington.  
Madison High School Science Club, Madison.

#### FELLOWS ELECTED 1938

Beghtel, Dr. F. E., Evansville College, Evansville.  
Graham, Prof. F. V., Ball State Teachers College, Muncie.  
Kriebel, Dr. Ralph, Soil Conservation Service, Bedford.  
Smith, Dr. B. H., Indiana State Teachers College, Terre Haute.  
Thornbury, Dr. W. D., Indiana University, Bloomington.

#### HONORARY FELLOW, ELECTED 1938

Arthur, Dr. Joseph Charles, Purdue University, Lafayette.