

PROCEEDINGS

*of the*

Indiana Academy  
*of Science*

*Founded December 29, 1885*

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Volume 63  
1953

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BENJAMIN MOULTON, EDITOR  
Butler University  
Indianapolis 7, Ind.

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Spring Meeting  
May 15-16  
SPRING MILL STATE PARK

Fall Meeting  
November 6  
EARLHAM COLLEGE

Published at Indianapolis, Indiana  
1954

1. **Instructions for Authors** appear at end of this volume, p. 284.
2. **Exchanges.** Items sent in exchange for the Proceedings and correspondence concerning exchange arrangements should be addressed:  
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5. The Constitution and by-laws reprinted from v. 62 and the Membership list reprinted from v. 61, are available to members upon application to the State Library, Indianapolis, Indiana. Necrologies reprinted from the various volumes can be supplied relatives and friends of deceased members by the Secretary.
6. Officers whose names and addresses are not known to correspondents may be addressed care the State Library. The address of the editor of the present volume is Dept. of Geography, Butler University, Indianapolis, Ind.

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## OFFICERS AND COMMITTEES FOR 1953

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### OFFICERS

President.....H. M. POWELL, Eli Lilly and Company  
Vice-President.....A. H. MEYER, Valparaiso University  
Secretary.....W. A. DAILY, Eli Lilly and Company  
Treasurer...F. J. WELCHER, Adult Education Center, Indiana University  
Editor.....BENJAMIN MOULTON, Butler University  
Press Secretary...J. A. CLARK, Department of Conservation, Indianapolis

### DIVISIONAL CHAIRMEN

Anthropology.....PAUL GEBHARD, Indiana University  
Bacteriology.....R. L. THOMPSON, Indiana University Medical Center  
Botany.....DANIEL DEN UYL, Purdue University  
Chemistry.....J. H. BILLMAN, Indiana University  
Entomology.....M. CURTIS WILSON, Purdue University  
Geology and Geography.....CLIFFORD ADAMS, Hanover College  
History of Science.....C. L. PORTER, Purdue University  
Mathematics.....ARTHUR ROSENTHAL, Purdue University  
Physics.....R. E. WINN, Indiana State Teachers College  
Psychology.....EDWARD T. JORDAN, Indiana State Teachers College  
Zoology.....W. H. JOHNSON, Wabash College

### EXECUTIVE COMMITTEE

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

C. Adams, J. H. Billman, J. A. Clark, N. M. Coats, E. R. Cumings,  
Mrs. F. K. Daily, W. A. Daily, J. J. Davis, D. Den Uyl, C. C. Deam,  
Ed. Degering, W. E. Edington, P. D. Edwards, H. E. Enders, P. Gebhard,  
A. T. Guard, R. N. Harger, W. H. Johnson, T. K. Just, J. S. Karling,  
R. W. Lefler, Eli Lilly, J. F. Mackell, M. S. Markle, M. G. Mellon, A. H.  
Meyer, H. H. Michaud, W. P. Morgan, Ben Moulton, F. Payne, C. L. Porter,  
J. E. Potzger, H. M. Powell, R. R. Ramsey, A. Rosenthal, R. L. Thompson,  
S. S. Visher, F. N. Wallace, P. Weatherwax, Winona Welch, F. Welcher,  
M. C. Wilson, R. E. Winn, T. G. Yuncker.

### BUDGET COMMITTEE

(President, Secretary, Treasurer, Editor, and Chairmen of  
Committees on Junior Academy, Library, Program  
and Relation of Academy to State)

H. M. Powell, W. A. Daily, F. J. Welcher, Ben Moulton, H. H. Michaud,  
N. M. Coats, M. S. Markle and F. N. Wallace.

## COMMITTEES ELECTED BY THE ACADEMY

- Trustees of the Academy Foundation** (term four years): Chairman, R. N. Harger, Indiana University School of Medicine, Indianapolis (term expires 1956); Ward J. Rice (term expires 1955).
- Bonding of Trustees** (elected annually): Chairman, R. C. Friesner, Butler University; Scott McCoy.
- Research Grants** (term five years): Chairman, T. G. Yuncker, DePauw University (term expires 1954); W. H. Johnson (1957), M. G. Mellon (1955), Paul Weatherwax (1956), Mason Hufford (1953), H. M. Powell and W. A. Daily (ex officio).

## STANDING COMMITTEES

(Appointed by the President)

- Auditing**: Chairman, W. P. Morgan, Indiana Central College; S. E. Elliott.
- Biological Survey**: Chairman, Mrs. Fay K. Daily, Butler University; H. J. Brodie, Franklin Buser, D. G. Frey, H. H. Michaud, Sherman Minton, Winona Welch, Frank Young.
- Index**: Chairman, Ben Moulton, Butler University; N. M. Coats, F. N. Wallace, Paul Weatherwax.
- Indiana Science Talent Search** (a sub-committee of the Junior Academy Committee): Chairman, R. W. Lefler, Purdue University; W. H. Welch, L. H. Baldinger, T. W. Torrey, P. D. Edwards, Walter Leckrone (ex officio).
- Invitations**: Chairman, John S. Karling, Purdue University; R. L. Hicks, J. Mizelle, T. G. Yuncker.
- Junior Academy**: Chairman, H. H. Michaud, Purdue University; Walter Carnahan, N. E. Adams, R. Niswander, R. McDougal, J. E. Potzger, J. L. Coopridger, P. L. Whitaker, R. E. Martin, R. Cooper, Max Forsyth.
- Library**: Chairman, N. M. Coats, State Library; W. G. Gingery.
- Membership**: Chairman, A. T. Guard, Purdue University; M. Burton, J. O. Cottingham, H. E. Crull, M. Garner, W. H. Headlee, R. L. Hicks, Z. D. Hurlbut, W. G. Kessel, E. Kintner, R. Laubengayer, L. S. McClung, A. H. Meyer, D. E. Miller, J. Seybert, A. Strickler, G. T. Wickwire, H. R. Youse.
- Necrologist**: W. E. Edington, DePauw University.
- Nominations**: Chairman, Paul Weatherwax, Indiana University; P. D. Edwards, J. F. Mackell.
- Program**: Chairman, M. S. Markle, Earlham College; Carrolle Anderson, M. R. Garner, R. L. Hicks, R. E. Martin, A. H. Meyer, Ben Moulton, J. E. Potzger, E. Wildman.
- Publication of Proceedings**: Chairman, Ben Moulton, Butler University; Paul Weatherwax, A. A. Lindsey, P. D. Edwards.
- Relation of Academy to State**: Chairman, F. N. Wallace, State Department of Conservation; J. A. Clark, H. J. Reed, Eli Lilly.

**Representative on Council of the A.A.A.S.:** Willis H. Johnson, Wabash College.

**Resolutions:** Chairman, J. E. Potzger, Butler University; P. D. Edwards, T. G. Yuncker.

**Fellows Committee:** Chairman, Winona Welch, DePauw University; Glen A. Black, L. S. McClung, F. J. Allen, G. E. Gould, A. H. Meyer, S. S. Visser, P. D. Edwards, J. F. Mackell, F. D. Brooks, W. R. Breneman.

# MINUTES OF THE SPRING MEETING

SPRING MILL STATE PARK  
SPRING MILL INN, MITCHELL, INDIANA  
MAY 15-16, 1953

President H. M. Powell called the Executive Committee Meeting to order at 4:25 P. M. in the Spring Mill Inn.

The officers and committees reported as follows:

**Editor.** Ben Moulton stated that Vol. 62 of the Proceedings is in page proof and should be distributed in June. The cost of the reprints is to be paid in full by the authors.

P. D. Edwards presented the following motion, "All new members be mailed the Proceedings published during the year in which the members were elected." This was approved.

**Press Secretary.** James Clark reported that publicity releases had been made to approximately 700 newspapers.

**Program Committee.** M. S. Markle suggested that titles of papers to be presented at the Fall Meeting be sent in as early as possible.

**Membership.** A. T. Guard reported 18 applicants for membership.

**Biological Survey.** Mrs. Fay K. Daily reported that because of the death of Dr. Ray C. Friesner and the severe illness of Dr. C. C. Deam, some duties of the State Flora Committee had been assumed by Dr. J. E. Potzger and Mr. Franklin Buser temporarily until reorganization of the State Flora Committee upon the return to this country of Dr. T. G. Yuncker in the fall.

## Old Business.

1. At the suggestion of W. E. Edington, a new committee was appointed by President Powell to erect a John S. Wright memorial plaque in the State Library. The members are John E. Potzger, Chairman; Nellie Coats, W. E. Edington, T. G. Yuncker, and John Seybert.

2. W. A. Daily will present a revision of the "Duties of Officers" at the Fall Meeting.

3. W. A. Daily reported that there is a reasonable possibility of a joint 1954 Spring Meeting of the Indiana and Kentucky Academies.

## New Business.

1. It was suggested by B. H. Meyer that we continue having two speakers for the general meeting during the Fall Meeting. There is a possibility that the Society of American Bacteriologists would provide a speaker.

2. Capt. S. V. Cox, Fort Richardson, Alaska, has volunteered to supply biological collections, photographs, etc., to Academy members from the above area.

3. The following motion was presented by Paul Weatherwax, "Research grants of fifty dollars or less are to be made in one payment in full." This was approved.

4. Alton A. Lindsey presented a suggestion that a "Natural Area Preservation Committee" be appointed by the president.

All reports were accepted. The meeting adjourned at 5:30 P. M.

**Dinner Meeting.** Following the dinner in Spring Mill Inn, the business session was called to order by President Powell in the recreation hall at 7:45 P. M.

1. The applications for membership were approved and accepted.

2. The motion that "all new members be mailed the Proceedings published during the year in which the members were elected" was also accepted.

Following the business session, excellent Kodachrome slides of the spring flora of Southern Indiana were shown by Mrs. Naomi Mullendore Hougham.

Dr. James Thorp of Earlham College then presented an illustrated talk concerning the soils of post-war Japan.

Announcements of field trips to be made the following day were then given. The leaders were: James Cope, J. E. Potzger, C. L. Bieber, Otis F. Starkey, T. M. Bushnell and C. J. Goodnight.

The following telegram was sent to Mr. Charles C. Deam of Bluffton, Indiana: "Sincere greetings and best wishes from the Indiana Academy of Science in session at Spring Mill State Park." W. A. Daily, Secretary.

One hundred and five members signed the Academy roll.

In spite of inclement weather, all scheduled hikes were held Saturday morning.

W. A. DAILY,  
Secretary.

# MINUTES OF THE EXECUTIVE COMMITTEE

EARLHAM COLLEGE, NOVEMBER 5, 1953

The Executive Committee of the 69th session was called to order by President Powell in Room 205, Dennis Hall, at 7:15 P. M.

The minutes of the Spring Meeting, held at Spring Mill State Park, were read and approved. The reports of officers and committee representatives were presented and accepted as follows:

**Treasurer.** Report of the Treasurer for the period January 1, 1953, to December 31, 1953.

## Receipts

Balance on hand January 1, 1953.....	\$3,770.57
Dues and initiation fees.....	2,174.00
Publications sold .....	41.12
Author's reprints Vol. 61.....	18.00
Author's reprints Vol. 62.....	506.64
	<hr/>
	\$6,510.33

## Disbursements

1—Editor Vol. 62.....	\$200.00
2—Expenses of Secretary.....	135.19
3—Expenses of Treasurer.....	130.83
4—Stationery .....	124.00
5—Program Committee .....	333.15
6—Kenneth Wagner research grant.....	75.00
7—S. S. Visher research grant.....	50.00
8—L. S. McClung research grant.....	50.00
9—Fay K. Daily research grant.....	35.00
10—Binding, Indiana Academy Science Library.....	697.68
11—Publication of Proceedings Vol. 61.....	1,830.74
12—Publication of Proceedings Vol. 62.....	678.62
13—Academy Conference .....	5.00
14—L. H. Petersen for refund on dues paid in error.....	8.00
15—Flowers, Charles C. Deam.....	15.75
16—Expenses to five officers as directed by action of 1947 Executive Committee .....	100.00
17—Surety bond (three-year term).....	62.50
18—Mailing Proceedings .....	118.08
19—Mailing Author's reprints.....	15.11
	<hr/>
	\$4,664.65
Balance on hand Jan. 1, 1954.....	1,845.68

\$6,510.33

Balance includes \$61.30 remaining in treasury from grant for preparation of manuscript of Indiana Scientists.

FRANK J. WELCHER, Treasurer  
W. P. MORGAN, Auditor  
S. E. ELLIOTT, Auditor

**Press Secretary.** James Clark reported that the usual press releases were prepared and distributed to newspapers and radio stations in the state.

**Editor and Publication of Proceedings.** Ben Moulton stated that the Proceedings of the Indiana Academy of Science, Vol. 62, containing 339 pages, was published in June, 1953. The total cost was approximately \$4,618.62.

**Trustees of the Academy Foundation.** In the absence of Chairman Harger, the Secretary reported for the fiscal year 1952-1953:

Assets as of October 1, 1953.....	\$12,406.00
Cash balance at the Indiana National Bank...	1,157.00

The trustees of the Foundation will invest a proper amount of the cash balance by Jan. 1, 1954.

**Bonding of Trustees.** The secretary read Scott McCoy's report that the bond covering the treasurer and the trustees has been renewed. The next expiration date is Nov. 18, 1956.

The nominations committee recommended that Scott McCoy continue on the Bonding Committee as chairman and that W. P. Morgan serve as the second member.

**Research Grants.** T. G. Yuncker reported that there were no applications received for grants. There is a total of \$556 in the fund. Any applications received will be carefully considered.

The Nomination Committee recommended that James F. Mackell become a member of the Research Grants Committee.

**Auditing Committee.** P. D. Edwards suggested that the Auditor's report, prepared after Dec. 31, 1953, be included in these minutes.

**Biological Survey.** Fay K. Daily reported the activities of members of the committee, and a proposal was made to circulate a questionnaire to all members of the Academy to learn the location and availability of bibliographies and collections in the state and the active workers in this field and to publish the results in the Proceedings of the Academy. The approximate cost was estimated to be about \$70.

**Fellows Committee.** Winona Welch reported that after many hours of study and several meetings, the committee wishes to nominate the following members for the rank of Fellow: W. L. Ayres, I. L. Baldwin, T. F. Barton, I. W. Burr, K. N. Campbell, J. O. Cottingham, Fay K. Daily, H. G. Day, H. E. Driver, F. K. Edmondson, Ned Guthrie, S. E. Hartsell, Edith Haynes, Ralph Hull, A. D. Hummel, Floy Hurlbut, J. L. Hyatt, J. S. Karling, H. Koffler, W. L. McAtee, F. C. Mathers, K. W. Meissner, Benjamin Moulton, J. C. Polley, R. L. Shelley, T. M. Sonneborn, O. P. Starkey, K. P. Williams.

**Indiana Science Talent Search.** R. W. Lefler reported as follows:

Seven regional science fairs were held in Indiana last spring as a follow-up for, and motivating factor for school science fairs in many communities throughout the state. More than 400 student projects were exhibited by some 500 students from 85 Indiana Junior and Senior High Schools.

Fourteen Indiana Senior High School students and their sponsoring teachers were sent to the National Science Fair in Oak Ridge. This con-

stituted the largest group of finalists from any state. Our students won a first place in Biological Sciences and a third place in Physical Science from the twelve awards presented.

Eight regional science fairs will be held in April, 1954. These will be followed in May by the National Science Fair which will be held at Purdue.

All Indiana scientists are invited to the 1953-54 culminating activity of the Indiana Science Talent Search, the Junior Assembly, which will be held at the Claypool Hotel in Indianapolis on March 27, 1954.

Kodachromes were then shown of the work done by participants in the Science Talent Search and the Science Fairs.

**Invitations.** John S. Karling stated that the Academy has been invited to meet on the Purdue Campus, Nov. 4 to 6, 1954.

**Junior Academy.** H. H. Michaud reported that:

The twentieth annual meeting of the Indiana Junior Academy of Science was held Saturday, Oct. 18, 1952 in the University Auditorium of Valparaiso University, Valparaiso, Indiana. Over two hundred club members, sponsors, and guests attended the meeting. It was the largest attendance the Junior Academy has recorded at an annual meeting.

There are at present forty-three clubs listed on our roll. At least thirty of these are known to be quite active.

Six new clubs have been added since our last report.

This year's program shows the largest selection of titles ever presented at a Junior Academy meeting.

The Junior Academy has continued to cooperate with the national and state science talent searches and the more recent development of regional science fairs. The latter have received considerable support from newspapers that have helped sponsor local science fairs.

The Indiana Academy of Science should take special note of these activities and should lend its support whenever possible. The State Science Talent Search Committee, under the direction of Prof. R. W. Lefler, is to be highly commended for the splendid work being done in the identification of science talented high school boys and girls and in promoting interest in science.

**Library.** Nellie Coats reported that ninety-eight serials have been added, making a total of eight hundred two titles currently received. All that began publication in 1950 or later, a date set by the Library of Congress, have been reported for inclusion in that institution's monthly New Serial Titles, a union catalog of continuations in various libraries.

The Proceedings, Volume 62, publication date June 30, 1953, were distributed to members and to institutions, 288 copies going to foreign countries.

Mrs. Harold Burton, Serials Librarian, prepared two hundred twenty-two volumes for binding at an estimated cost of \$696.84, actual cost to the Academy \$697.68.

**Membership.** In the absence of Chairman A. T. Guard, A. A. Lindsey stated that there are at this time 32 applicants for membership in the Academy.

**Relation of Academy to State.** Frank N. Wallace stated that unless otherwise instructed in the near future, he will continue to ask the Indiana Legislature to appropriate \$3,500 to aid in the publication of the Proceedings.

**Old Business.**

Dr. J. E. Potzger, chairman, reported as follows: The John Shephard Wright Memorial Committee had several meetings and discussions to make plans for construction and placing of a plaque to mark the John S. Wright Memorial Library in a fitting manner. It is recommended that an 18 x 8 inch bronze plaque with raised letters be fixed to a 5½ foot walnut standard, to be placed in the junction of corridors marking the entrance to the Academy Library housed in the State Library Building. The total cost will be approximately \$100.

**Duties of Officers.** It was suggested that the revised "Duties," with some additions, be reproduced in an appropriate quantity, but not to be printed in the Proceedings.

**New Business.**

Five dollars will be sent to the Academy Conference of the A.A.A.S. to aid in defraying office expenses.

The meeting adjourned at 10:10 P. M.

W. A. DAILY,  
Secretary

## MINUTES OF THE GENERAL SESSION

EARLHAM COLLEGE, NOV. 6, 1953

President T. E. Jones of Earlham College welcomed the Academy to their campus. A response was given by H. M. Powell, president of the Academy.

The minutes of the Executive Committee were read and approved.

W. E. Edington presented a short biography of the members who had died during the year. These were: Clarence E. Baker, George W. Benton, charter member; Philip W. Berg, Charles C. Deam, Ray C. Friesner, Llewellyn V. Ludy, Jasper P. Scott, Karlis Stares and P. F. Tryon.

T. G. Yuncker gave an illustrated lecture on the subject, "Scenes from the South Pacific."

Dr. D. M. Dack of the Food Research Institute, Chicago, and President of the Society of American Bacteriologists presented a very interesting and stimulating address entitled, "Present Day Problems in Food Poisoning."

The meeting adjourned at 11:15 A. M.

Sectional meetings then began with a recess for lunch served in the campus cafeteria at 12:30 P. M. after which meetings were resumed.

The annual dinner was held in the main floor dining room, Earlham Hall. President Powell introduced guests and the officers of the Academy at the speaker's table.

Dr. Earl Brooks gave a short history of the Indiana Audubon Society.

President H. M. Powell then gave a scholarly address on the subject, "Some Recent Advances in Experimental Chemotherapy."

During the following short business session, A. T. Guard presented the names of 40 applicants for membership. These were duly elected.

J. E. Potzger presented the following resolutions:

1. That the Indiana Academy of Science express sincere thanks to President Thomas E. Jones and faculty of Earlham College for the warm welcome extended to us, and for the many services rendered to make our convention both pleasant and profitable.

2. That special appreciation be expressed to Dr. M. S. Markle, chairman of the program committee, for the efficient manner in which all arrangements, necessary for a successful convention, were made.

3. That we thank the students of Earlham College who aided in making the meetings and plans for dinner and banquet operate so very efficiently.

The Nominations Committee report was given by the Chairman, Paul Weatherwax. Divisional Chairmen for 1954 will be: Anthropology, Thomas B. Noble, Indianapolis; Bacteriology, Dorothy Powelson, Purdue University; Botany, Richard Starr, Indiana University; Chemistry, R. G. Larson, Valparaiso University; Entomology, Paul T. Ulman, Noblesville; Geology and Geography, Benjamin Moulton, Butler University; History of Science, M. S. Markle, Earlham College; Mathematics, Ralph Hull,

Purdue University; Physics, George D. Van Dyke, Earlham College; Zoology, John D. Mizelle, University of Notre Dame.

The following members were recommended to serve as the 1954 officers: President, O. B. Christy, Muncie, Indiana; Vice-President, Raymond Girton, Purdue University; Secretary, W. A. Daily, Eli Lilly and Company; Treasurer, Frank Welcher, Indiana University Education Center, Indianapolis; Editor, Benjamin Moulton, Butler University; Press Secretary, J. A. Clark, Department of Conservation, Indianapolis.

The sixty-ninth annual meeting of the Indiana Academy of Science with a general attendance of 430 and a dinner attendance of 123 was adjourned.

W. A. DAILY,  
Secretary.

## NEW MEMBERS 1953<sup>1</sup>

Agnita, Sister Mary, S.P., Clinton and Lewis Sts., Fort Wayne, Ind.	C
Allmon, Ross H., 4201 N. Clarendon Ave., Chicago 13, Ill.	E
Ash, Charles R., 3741 Second St., Riverside, Cal.	E
Barton, James D., Jr., 130 Marstellar St., West Lafayette, Ind.	Bo
Becht, Dr. J. Edwin, 208 S. Union St., Bloomington, Ind.	G
Brooks, C. Reid, R. R. 1, Greens Fork, Ind.	G, Z
Bunce, George W., 443 N. Cline, Griffith, Ind.	Bo, Z, C
Cameron, Donald K., Jr., Box 33, Roger's Center, Bloomington, Ind.	G
Celine, Sister M., O.S.F., St. Francis Col., 2701 Spring St., Fort Wayne, Ind.	Bo, Z
Cleveland, Merrill L., 11-10 Ross Ade Dr., West Lafayette, Ind.	E
Correll, Prof. Malcolm, 422 Anderson St., Greencastle, Ind.	Ph
Coulter, Nancy M., Y.W.C.A. Residence, 802 N. Lafayette Blvd., South Bend, Ind.	C
Deal, Prof. Duane E., Ball State Teachers College, Muncie, Ind.	M
Doeden, Gerald E., 703 Franklin St., Valparaiso, Ind.	C
Drummond, Roger O., Dept. of Zoology, Univ. of Maryland, College Park, Md.	Z
Eaton, Dr. Scott V., Lincoln Hills, R. R. 4, Valparaiso, Ind.	Bo
Elder, Dr. F. Kingsley, Jr., Physics Dept., Wabash College, Crawfordsville, Ind.	Ph
Ellis, Dr. Nathan Kent, Dept. of Horticulture, Purdue University, West Lafayette, Ind.	Bo
Fields, Marion Lee, 1036 Chestnut St., Columbus, Ind.	Bo
Friedman, Samuel A., Indiana State Geol. Sur., Indiana University, Bloomington, Ind.	G
Funderburg, John Arthur, R. R. 5, Huntington, Ind.	M
Glenn, A. H., A. H. Glenn and Assoc., 111 New Orleans Airport, New Orleans 22, La.	G
Goldthwaite, Marion, 210 Berkeley Rd., Indianapolis, Ind.	Ba
Gordon, William R., Jr., Lincoln H. S., Cambridge City, Ind.	Bo, Z
Goss, Robert C., F.P.H.A. 517-4 Airport Rd., West Lafayette, Ind.	Bo
Guthrie, Frank A., 108 Monroe Blvd., Terre Haute, Ind.	C
Haldar, Dr. Barun Chandra, Dept. of Chemistry, Notre Dame University, Notre Dame, Ind.	C
Heise, John J., R. F. D., Paoli, Ind.	C
Hennings, Prof. George, 526 N. Martin St., Muncie, Ind.	Bo
Huelsman, Benjamin R., 408 N. Grant St., Bloomington, Ind.	A
Hults, Malcom Eugene, 3007 Ethel Ave., Muncie, Ind.	Ph
Jones, Dr. G. Neville, Dept. of Botany, Univ. of Illinois, Urbana, Ill.	Bo
Jordan, Prof. Edward T., 524 S. 5th St., Terre Haute, Ind.	Ps
Kilduski, Robert J., 617 213th Pl., Dyer, Ind.	E
Kyle, Robert K., 440 School St., Culver, Ind.	Ba, Bo, H, Z

<sup>1</sup> Abbreviations following the members' listings indicate the section of the Academy with which they are affiliated.

Ledwell, Mrs. Shirley F., 3724 S. Washington St., Marion, Ind.	Ba
Lehker, Prof. Glen E., 473 Littleton St., West Lafayette, Ind.	E
Leighly, Prof. Hollis P., Lawrenceville, Ill.	C, G
Leopold, Dr. A. Carl, Horticulture Dept., Purdue University, Lafayette, Ind.	Bo
Liming, Alfred Newton, 762 West St., Versailles, Ind.	Bo
Lingappa, B. T., Dept. Biol. Sci., Purdue University, Lafayette, Ind.	Bo
McKenna, Dr. Frank S., 314 Arlington Ave., Greencastle, Ind.	Ps
McMackin, Mrs. Sarah F., 4308 S. Harmon St., Marion, Ind.	Ba
MacFarlane, Dr. John O., Eli Lilly and Co., Indianapolis, Ind.	Ba
Maffet, Vere, Ross Ade Drive, Bldg. 1, Apt. 11, West Lafayette, Ind.	C
Magoon, Dr. Wallace, Ball State Teachers College, Muncie, Ind.	Z
Miller, Brinton M., 204 Perrin Ave., Lafayette, Ind.	Bo
Moore, Doxie, 2043 S. 9th St., Lafayette, Ind.	
Mozen, Milton M., Col. of Agriculture, Dept. of Bio-chemistry, Univ. Wisconsin, Madison 6, Wis.	C
Mumford, Russell E., R. R. 1, Cortland, Ind.	Z
Murray, Dr. Haydn H., Dept. of Geology, Indiana University, Bloomington, Ind.	G
Naugle, Jack E., 417 E. Main St. (Levee), West Lafayette, Ind.	E
O'Brien, Mrs. Gladys, 410 N. Chester, Indianapolis, Ind.	G
Oster, Irwin I., 1603 E. 3rd St., Bloomington, Ind.	Z
Overlease, William R., 1820 Stevens Ave., Elkhart, Ind.	Bo, G, Z
Pelton, Mrs. Jeanette S., 411 Buckingham Dr., Indianapolis, Ind.	Bo
Pelton, Dr. John F., Dept. of Botany, Butler Univ., Indianapolis, Ind.	Bo
Pfaff, Richard Lee, 44 S. 21st St., Richmond, Ind.	G
Platt, Dr. Charles E., 309 Harrison Hall, DePauw University, Greencastle, Ind.	Ps
Plummer, Gayther L., Dept. of Biol. Sci., Purdue University, West Lafayette, Ind.	Bo
Pray, Dr. Enos G., Hanover, Ind.	Z
Proctor, Mrs. Berdine R., 4726 E. Washington St., Indianapolis, Ind.	Bo, Z
Reitz, Dr. Henry C., R. R. 10, Lafayette, Ind.	C
Repaske, Dr. Roy, Dept. of Bacteriology, Indiana University, Bloomington, Ind.	Ba
Richey, Gilbert T., Jr., 1850 N. Whittier Pl., Indianapolis, Ind.	C
Ricketts, Dr. John A., 3 Observatory Hill, Greencastle, Ind.	C
Riely, Samuel L., Dept. of Geology, Indiana Univ., Bloomington, Ind.	G
Scarborough, Dr. Barron B., DePauw University, Greencastle, Ind.	Ps
Shiner, Dr. V. J., Jr., 111 N. Dunn St., Bloomington, Ind.	C
Sinski, James T., 420 Hayes, West Lafayette, Ind.	Bo
Stars, Mrs. Helene, 2915 Guilford, Indianapolis, Ind.	Bo
Starr, Dr. Richard C., Dept. of Botany, Indiana University, Bloomington, Ind.	Bo
Strickler, Dr. Paul M., Indiana Central Col., Indianapolis 27, Ind.	Ph
Stuck, Mrs. Dollie N., 1309 N. Pennsylvania St., Indianapolis, Ind.	Bo
Sutter, Delos M., 222 Douglas Ave., Kalamazoo, Mich.	Ph
Swinehart, Bruce A., 509 Evergreen St., West Lafayette, Ind.	C
Telfair, Dr. David, Earlham College, Richmond, Ind.	

Thanos, Dr. Andrew, Dept. K-490, Eli Lilly & Co., Indianapolis, Ind.	Bo
Thomson, William E., 128 Stirton St., Hamilton, Ontario, Canada	G
Thorp, Prof. James, Earlham College, Richmond, Ind.	G
Tolman, Robert A., 701 N. Dunn St., Bloomington, Ind.	Z
Wahl, Lucille, 941 Hervey St., Indianapolis, Ind.	Bo
Welcher, Mrs. Frank J., R. R. 12, Box 242W, Indianapolis 44, Ind.	Z
Wilson, Kenneth S., F.P.H.A. 206-4 W. State St., W. Lafayette, Ind.	Bo
Woerner, Dr. Dale E., Hanover College, Hanover, Ind.	C
Wood, Elmo S., Box 14, New Castle, Ind.	C, Bo
Wood, Joseph M., Dept. of Botany, Indiana Univ. Bloomington, Ind.	Bo
Zlab, Dennis K., 309 Sheridan Ave., Crawfordsville, Ind.	Bo

## JUNIOR ACADEMIES

Albertus Magnus Science Club, Central Catholic H. S., Clinton and Lewis, Fort Wayne, Ind.	C, Ph
Griffith H. S. Science Club, 202 Broad St., Griffith, Ind.	Bo, Z, Ph, C
Junior Explorers of Science, Lebanon H. S., Lebanon, Ind.	Bo, Z, Ph, C
Biology Club, Martin Boots Jr. H. S., Grade 9, 715 W. 3rd St., Marion, Ind.	Bo, Z



INDIANA JUNIOR ACADEMY OF SCIENCE OFFICERS FOR 1953

From left to right: Gail Diamondis, South Bend, Press Secretary; Don Lambdin, Elkhart, Vice-President; David Stevenson, Fort Wayne, President; Mina Zaldivar, Gary, Secretary.

INDIANA JUNIOR ACADEMY OF SCIENCE

OFFICERS FOR 1953

PRESIDENT: David Stevenson, Phy-Chem Club, Elmhurst H. S., Ft. Wayne.

VICE-PRESIDENT: Don Lambdin, Junior Academy, Elkhart H. S., Elkhart.

SECRETARY: Mina Zaldivar, Biology Club, Lew Wallace H. S., Gary.

PRESS SECRETARY: Gail Diamondis, Junior Academy, Central H. S., South Bend.

MEMBERS OF THE COUNCIL: Max Forsyth, Indianapolis (1949-1953); Harold Stewart, Bloomington (1950-1954); Arthur L. Smith, South Bend (1951-1955); Charles E. Karst, Mishawaka (1952-1956); Edith Wallace, Gary (1953-1957).

## PROGRAM OF THE TWENTY-FIRST ANNUAL MEETING

November 7, 1953

Dennis Science Hall

Earlham College, Richmond, Indiana

8:00-10:00 a. m. Exhibits, Dennis Science Hall, Rooms 114, 120.

10:00 a. m. Morning Session, Auditorium, Dennis Science Hall.

General Session. David Stevenson, presiding.

Reading of the minutes of the 1952 meeting, Mina Zaldivar, Secretary.

Greetings, Gene Chenoweth, President, Earlham College Senate.

Papers:

Albertus Magnus Science Club, Central Catholic H. S., Fort Wayne:

1. Alumina Chromatography, Patrick Ledden.

National Scientific Honor Society, Bloomington H. S., Bloomington:

2. Fluorescence of Minerals, Joseph Moser.

3. Fundamentals of Electron Tubes, Robert Joseph Strain.

4. Bacteriology, John Costas.

Adams Walton Club, John Adams, H. S., South Bend:

5. What Happened to Charlie?, James Dincolo.

Science Club, Calumet H. S., Gary:

6. Collecting Turtles of Indiana, Jerry Shaffer.

Naturalist's Club, Shortridge H. S., Indianapolis:

7. Illustrating the Theory of Bird Flight, Shelia Brantlinger.

Science Club, Howe H. S., Indianapolis:

8. Amphibians of Indiana, Larry Kinsey.

9. Tissue Cultures, James Barnes.

10. Culture of Fern Prothalia, Ronnie De Langlade.

11. Microdissection of Daphnia, Joan Brown.

12. Mycology, Bob Little.

12:15 p. m. Noon Luncheon, Earlham College Cafeteria.

1:15 p. m. Afternoon Session, Auditorium, Dennis Science Hall.

Business Session.

Science Club, Howe H. S., Indianapolis:

13. Medical Mycology, Dick Slaughter.

14. Astronomy, Bill Crawley.

15. Raising of Cecropia Moths, Terry Hankins.

16. Ecological Survey of Ellenberger Park and Pleasant Run Parkway, Kent Stewart and Dave Harvey.

17. The Effect of X-Ray on Tomato Seedlings, Elizabeth Tinchler.

Central Junior Academy, Central H. S., South Bend:

18. Relativity of the Atom, Arthur H. L. From.

19. The General Nature of Amino Acids, Ruth E. Falk.

20. A Study in the Behavior of Hamsters, Rita Payton and Patricia Price.

Science Club, Valparaiso H. S., Valparaiso:

21. Paper Chromatography, Mary Anne Miller.

Junior Academy of Science, Elkhart High School, Elkhart:

22. The Construction of Simple Binary Relay Computing Machines, Frederick Blackwell.

Science Club, University H. S., Bloomington:

23. A Study of the Fish Life of Selected Streams and Lakes of Indiana, John Clayton.
24. Techniques of Cave Exploring, Science Club Members.
25. My Experience at the National High School Institute Program in the Engineering Class, Esther Irwin.

Biology Club, Lew Wallace H. S., Gary:

26. Reptiles (illustrated), Bill Mitchell.

Science Club, New Castle H. S., New Castle:

27. Some Interesting Findings from High Voltage Experiments, Thor Semler.

### MINUTES

The twenty-first annual meeting of the Indiana Junior Academy of Science was held Saturday, November 7, 1953 in the auditorium of Dennis Science Hall, Earlham College, Richmond, Indiana.

The exhibit room opened at 8:00 a. m. in rooms 114 and 120 in the Science Hall. A total of eighteen science projects were displayed by the club members.

The general session was called to order at 10:15 a. m. by President David Stevenson, Phy-Chem Club, Elmhurst H. S., Fort Wayne. The president introduced the other officers, Vice-President, Don Lambdin, Junior Academy, Elkhart H. S., Elkhart, and the Secretary, Mina Zaldivar, Biology Club, Lew Wallace H. S., Gary

The minutes of the 1952 meeting were reviewed by the Secretary. Gene Chenoweth, President of the Earlham College Senate, welcomed all members and friends of the Junior Academy of Science in behalf of the college.

Patrick Ledden, Albertus Magnus Science Club, Central Catholic H. S., Fort Wayne, opened the morning program of student papers with a talk on "Alumina Chromatography."

"Fluorescence of Minerals" was the topic presented by Joseph Moser, National Scientific Honor Society, Bloomington H. S., Bloomington. His demonstration of laboratory materials added considerable value to his paper.

Robert Joseph Strain, National Scientific Honor Society, Bloomington, spoke on the "Fundamentals of Electron Tubes." It was a fascinating subject and John's drawings illustrated the talk very well.

"Bacteriology" was the next subject presented by John Costas, National Scientific Honor Society, Bloomington. John's discussion showed that he had done considerable work in bacteriology.

John Dincolo, Adams Walton Club, John Adams H. S., South Bend, next gave an interesting and amusing account of "What Happened to Charlie?" Charlie was a lion that had to be poisoned because he became too difficult to handle. The incident resulted in a project of taxidermy for the Walton club members which was pleasantly recorded in kodachrome slides.

Shelia Brantlinger, Naturalist's Club, Shortridge High School, Indianapolis, followed with an illustrated talk on the "Theory of Bird

Flight." She explained the mechanics of flight and some of the bird's adaptations for flight.

A discussion on "Amphibians in Indiana" was given by Larry Kinsey, Science Club, Howe H. S., Indianapolis. He explained how experiments were conducted on artificial hibernation.

James Barnes, Science Club, Howe H. S., explained how he became interested in the subject of "Tissue Cultures," and the "Culture of Fern Prothalia" was presented by Ronnie De Langlade, also of the Science Club of Howe H. S.

The last two topics on the morning session were given by Joan Brown, on "Microdissection of Daphnia" and by Bob Little on "Mycology." Both students are members of the Science Club, Howe H. S.

The morning session was adjourned at 12:05 p. m. by President David Stevenson. Luncheon was served at the College Cafeteria.

The afternoon session was called to order at 1:15 p. m. by David Stevenson. The first item of the business meeting was the election of officers. A slate of officer candidates was submitted by the council and additional nominations were accepted from the floor. The following officers were elected for 1954: President, James Dincolo, Adams Walton Club, John Adams H. S., South Bend; Vice-President, Larry Kinsey, Science Club, Howe H. S., Indianapolis; Secretary, Janet Golba, Adams Walton Club, John Adams H. S., South Bend.

The afternoon program of student talks was opened by the following members of the Science Club, Howe H. S., Indianapolis: Dick Slaughter spoke on "Medical Mycology," Bill Crawley on "Astronomy," Terry Hankins on "Raising of Cecropia Moths" and Elizabeth Tincher on "The Effect of X-Ray on Tomato Seedlings."

Students of the Central Junior Academy, Central H. S., South Bend, presented papers as follows: Arthur H. L. From presented a discussion on the "Relativity of the Atom," Ruth E. Falk on "The General Nature of Amino Acids," and Rita Payton and Patricia Price on "A Study in the Behavior of Hamsters." The latter talk was especially interesting to the audience. A live hamster was used to show how it had learned to take food from a bottle by pulling on a string that was tied to the food.

Mary Anne Miller, representing the Science Club of Valparaiso H. S., Valparaiso, gave a talk on "Paper Chromatography."

"The Construction of Simple Binary Relay Computing Machines" was the topic given by Frederick Blackwell, Junior Academy of Science, Elkhart H. S., Elkhart. He explained the parts of a computing machine and how computers use the binary subtraction and addition systems.

The following speakers represented the Science Club, University H. S., Bloomington: John Clayton spoke on "A Study of the Fish Life of Selected Lakes and Streams of Indiana." Several Science Club members spoke on various phases of "Techniques of Cave Exploring," and Esther Irwin on "My Experience at the National High School Institute Program in the Engineering Class."

Bill Mitchell, Biology Club, Lew Wallace H. S., Gary, presented an illustrated talk on "Reptiles."

The concluding talk on "Some Interesting Findings from High Voltage Experiments" was presented by Thor Semlar, Science Club, New Castle H. S., New Castle. Thor showed several interesting experiments with the use of high voltage.

Professor Howard H. Michaud, Department of Forestry, Purdue University and State Sponsor of the Junior Academy of Science, reported on the progress of the high school science clubs in the state, and on the importance of the state-wide science activities of the past year. Special mention was made of the new clubs for 1953 which included the following: Junior Explorers of Science, Lebanon H. S., Lebanon, Miss Helen E. Reed, Sponsor; Biology Club, Martin Boots Junior H. S., Marion, Mr. John Clevenger, Sponsor; Science Club, Griffith H. S., Griffith, Mr. George Bunce, Sponsor; and the Albertus Magnus Science Club, Central Catholic H. S., Fort Wayne, Sister Mary Agnita, Sponsor.

The importance of the National and Indiana Science Talent Searches was emphasized. Professor Michaud stated that eighty-five of the eighty-eight students who entered the science talent search last year are at present attending college. He mentioned that the Junior Academy also cooperates in sponsoring the regional science fairs which were started in Indiana last spring.

It was announced that Miss Jerry Motley, Sponsor, Science Club, Howe H. S., Indianapolis, was elected new council member to succeed Mr. Max Forsyth of Indianapolis whose term expired in 1953.

Joseph Moser, National Scientific Honor Society, Bloomington H. S., Bloomington, was chosen as "best boy" and Joan Brown, Howe H. S., Indianapolis, was named "best girl" in science for 1953. David Stevenson, Elmhurst H. S., Fort Wayne, and Mary Anne Miller, Valparaiso H. S., Valparaiso, received honorable mention. The winners of these awards are selected on the basis of information about each student submitted by sponsors of the Junior Academy clubs. Those who achieve this honor are given a year's membership in the American Association for the Advancement of Science.

More than forty high school science clubs are affiliated with the Indiana Junior Academy of Science. The twenty-first annual session at Earlham College was the most successful meeting ever enjoyed by the Junior Academy. There was greater participation, more interest, and a larger attendance than in any previous year. Two hundred and fifty students, teachers and guests were registered.

The Junior Academy will meet at Purdue University for its twenty-second annual session on November 6, 1954.

After expressing his thanks to all who participated in the program, to Earlham College and to all who attended, President David Stevenson adjourned the 1953 meeting.

#### EXHIBITS

*Antibiotics; Fluorescence of Minerals:* National Scientific Honor Society, Bloomington H. S., Bloomington.

*Spelunking Equipment; Fish Display:* Science Club, University H. S., Bloomington.

*Insect Collection*: Junior Academy of Science, Elkhart H. S., Elkhart.  
*A Study of Loci; Method of Delaying Sound; Model Paper Mill*: Phy-Chem Club, Elmhurst H. S., Fort Wayne.

*Reptiles*: Biology Club, Lew Wallace H. S., Gary.

*Raising Cecropia Moths; Medical Mycology; Ecological Survey of Ellenberger Park and Pleasant Run Parkway*: Science Club, Howe H. S., Indianapolis.

*Insect Collection*: Naturalist's Club, Shortridge H. S., Indianapolis.

*Cactus Collection; 3-Dimension; Staining and Clearing Small Animals*: Science Club, Richmond Senior H. S., Richmond.

*Behavior of Hamsters*: Junior Academy of Science, Central H. S., South Bend.

*Oil Fractional Column*: Science Club, Valparaiso H. S., Valparaiso.

INDIANA JUNIOR ACADEMY OF SCIENCE CLUBS

FALL 1953

<i>Town</i>	<i>School and Club</i>	<i>Sponsor</i>
1. Attica	H. S., Sci-Math. (1949)	J. Claude Daugherty
2. Bedford	H. S., Science, (1951)	Elmer Wright
3. Bloomington	H. S., National Scientific Honor Society, (1931)	Harold Stewart
4. Bloomington	University H. S., Junior Academy, (1938)	Robert Carpenter P. L. Whitaker
5. Clayton	H. S., Junior Academy, (1951)	Howard C. Lewis
6. Crawfordsville	H. S., Up-N-Atom, (1950)	David Wells
7. Elkhart	H. S., Junior Academy, (1940)	Evelyn Wagoner
8. Fort Wayne	Central H. S., Nature, (1940)	Iva Spangler
9. Fort Wayne	Central Catholic H. S., Albertus Magnus Science Club, (1952)	Sister Mary Agnita, S.P.
10. Fort Wayne	Elmhurst H. S., Phy-Chem (1935)	Ruth Wimmer
11. Fort Wayne	North Side H. S., Nature, (1952)	Vesta Thompson
12. Gary	Calumet Twp. H. S., Science, (1952)	Mrs. Catherine Dale
13. Gary	Edison H. S., Beaker Breakers, (1949)	Mrs. Martha B. Connor
14. Gary	Lew Wallace H. S., Biology, (1935)	Lola Lemon
15. Gary	Lew Wallace H. S., Klub Kem, (1941)	Mrs. Helen McKenzie
16. Gary	Tolleston H. S., Biology, (1952)	Edith Wallace

<i>Town</i>	<i>School and Club</i>	<i>Sponsor</i>
17. Gary	Tolleston H. S., Future Scientists of America, (1949)	Arthur Kline
18. Gary	Wirt H. S., Biology (1945)	Mrs. Frances Huddleston
19. Gas City	Mississinewa Joint H. S., Science, (1936)	Roy McKee
20. Griffith	H. S., Science, (1953)	George M. Bunce
21. Hammond	Morton School, Science, (1949)	Nancy Lou Ritter
22. Hobart	H. S., Science, (1952)	Lola Stewart
23. Huntingburg	H. S., Science, (1949)	Wilmer K. Pellett
24. Indianapolis	Shortridge H. S., Naturalist's Club, (1947)	Max Forsyth
25. Indianapolis	Shortridge H. S., Science, (1931)	Mrs. Henrietta Parker
26. Indianapolis	Technical H. S., Nature, (1932)	Howard L. Cook
27. Indianapolis	Howe H. S., Science, (1949)	Jerry Motley
28. Indianapolis	Washington H. S., Science, (1931)	Estil Van Dorn
29. Lebanon	H. S., Jr. Explorers of Science, (1953)	Helen E. Reed
30. Lowell	H. S., Science, (1935)	Robert J. Brannock
31. Marion	H. S., Science, (1936)	Keith Stroup
32. Marion	Martin Boots Jr. H. S., Biology, (1953)	John Clevenger
33. Mishawaka	H. S., Science, (1936)	Darl F. Wood
34. New Albany	H. S., Science, (1935)	L. S. Rose
35. New Castle	H. S., Science, (1947)	Mary Rankin
36. Richmond	H. S., Science, (1950)	Kathryn Coulter
37. South Bend	Central H. S., Junior Izaak Walton, (1949)	A. L. Smith
38. South Bend	John Adams H. S., Adams Walton, (1953)	Ernest Litweiler
39. Sullivan	H. S., Camera, (1939)	Ruth Hinkle
40. Terre Haute	State H. S., Senior Science, (1939)	Russell McDougal
41. Valparaiso	H. S., Science, (1931)	Gerald Doeden