

PROCEEDINGS

of the

Indiana Academy
of Science

Founded December 29, 1885

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Volume 59

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ALTON A. LINDSEY, EDITOR

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Spring Meeting
May 13 and 14
CLIFTY FALLS

Fall Meeting
November 3, 4, and 5
WABASH COLLEGE

Members planning to contribute abstracts or papers to future volumes are requested to consult "Instructions for Contributors" at the end of this volume.

Copies of the Proceedings may be purchased through the State Library, Indianapolis, Indiana, at \$3.00 per volume. All items sent in exchange for the Proceedings and all communications to officers of the Academy, when their names and addresses are not known, should also be sent to the State Library.

Reprints of certain parts of recent volumes of the Proceedings are available for distribution as follows: copies of the constitution and by-laws (Vol. 44), and complete membership list (Vol. 56), may be secured by members elected subsequent to the publication of those volumes; copies of the codified list of duties of officers (Vol. 48) may be secured by officers, divisional chairmen, and chairmen of committees; and copies of the necrology can be supplied to relatives and friends of the deceased members. Inquiries concerning these reprints should be addressed to the Secretary of the Academy, Dr. W. A. Daily, Eli Lilly Company, Indianapolis, Indiana.

Reprints of technical papers in recent volumes can often be secured from the authors. They cannot be supplied by the State Library nor by the officers of the Academy.

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OFFICERS AND COMMITTEES FOR 1949

OFFICERS

President, CHARLES L. PORTER, Purdue University.
Vice-President, STEPHEN S. VISHER, Indiana University.
Secretary, O. B. CHRISTY, Ball State Teachers College.
Treasurer, WILL P. MORGAN, Indiana Central College.
Editor, E. S. GANTZ, Purdue University.
Press Secretary, WILLIAM A. DAILY, Butler University.

DIVISIONAL CHAIRMEN

Anthropology, G. K. NEUMANN, Indiana University.
Bacteriology, I. C. GUNSALUS, Indiana University.
Botany, DR. A. R. BECHTEL, Wabash College.
Chemistry, WILLIAM G. KESSEL, Indiana State Teachers College.
Entomology, EDWARD KINTNER, Manchester College.
Geology and Geography, PRESTON MCGRAIN, Indiana Flood Control and Water Commission.
History of Science, PAUL WEATHERWAX, Indiana University.
Mathematics, PAUL OVERMAN, Purdue University.
Physics, ANCIL R. THOMAS, Valparaiso University.
Psychology, E. J. ASHER, Purdue University.
Zoology, MURVEL R. GARNER, Earlham College.

EXECUTIVE COMMITTEE

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

William Wallace, Robert F. Ervin, A. R. Bechtel, William G. Kessel, Edward Kintner, Preston McGrain, Paul Weatherwax, Paul Overman, Ancil R. Thomas, E. J. Asher, Murvel R. Garner, C. A. Behrens, O. B. Christy, W. A. Daily, J. J. Davis, C. C. Deam, E. F. Degering, W. E. Edington, H. E. Enders, R. C. Friesner, E. S. Gantz, Theodor Just, Eli Lilly, J. F. Mackell, E. G. Mahin, C. A. Malott, M. S. Markle, M. G. Mellon, H. H. Machard, W. P. Morgan, F. Payne, R. R. Ramsey, F. B. Wade, F. N. Wallace, Winona H. Welch, J. S. Wright, T. G. Yuncker, Stephen S. Visher, Charles L. Porter, K. S. Means, W. E. Ricker, Ralph E. Cleland, Nellie M. Coats, J. E. Switzer, Willis H. Johnson.

BUDGET COMMITTEE

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

Charles L. Porter, Purdue University; O. B. Christy, W. P. Morgan, E. S. Gantz, H. H. Michaud, Nellie M. Coats, W. H. Johnson.

COMMITTEES

(Elected by the Academy)

- Trustees of Academy Foundation* (Term 4 years): Chairman, J. S. Wright, Eli Lilly and Co., Indianapolis (term ex. 1952); F. B. Wade (term ex. 1951).
- Bonding of Trustees* (elected annually): Chairman, R. C. Friesner, Butler University; Scott McCoy.
- Research Grants* (term 5 years): Chairman, T. G. Yuncker, DePauw University (term ex. 1949), E. G. Mahin (1952), H. H. Remmers (1950), Paul Weatherwax (1951), J. S. Wright (1953), Charles L. Porter and O. B. Christy (ex. officio).

COMMITTEES APPOINTED BY THE PRESIDENT

- Auditing*: Chairman, K. S. Means, Butler University; S. E. Elliott.
- Biological Survey*: Chairman, W. E. Ricker, Indiana University; W. P. Allyn, W. B. Barnes, H. J. Brodie, L. C. Cole, Fay K. Daily, H. O. Deay, R. C. Friesner, H. H. Michaud, H. H. Vogel, Winona H. Welch.
- Fifty-Year Index*: Chairman, R. C. Friesner, Butler University; Nellie M. Coats, W. P. Morgan, F. N. Wallace, Paul Weatherwax.
- Invitations*: Chairman, Professor Ralph E. Cleland, Indiana University; John S. Karling, Edward Kintner, Fred A. Loew, Edna Banta, Floyd Beghtel.
- Junior Academy*: Chairman, H. H. Michaud, Purdue University; N. E. Adams, W. P. Allyn, F. R. Elliott, E. Kintner, M. S. Markle, R. Earl Martin, A. Strickler, F. B. Wade, P. L. Whitaker.
- Indiana Science Talent Search*: A sub-committee of the Junior Academy Committee—Chairman, R. W. Lefler, Purdue University; F. Payne, P. D. Edwards, Winona H. Welch, Lawrence H. Baldinger, Charles L. Porter, and Walter Leckrone (ex officio).
- Library*: Chairman, Nellie M. Coats, Indiana State Library, Indianapolis; W. G. Gingery, R. C. Friesner.
- Membership*: Chairman, J. E. Switzer, Indiana University; M. H. Ahrendt, Juna L. Beal, E. Byren, Jr., M. Chanin, J. J. Davis, S. R. Esten, G. F. Hennion, L. B. Howell, J. L. Hyatt, Alma Long, J. A. Marling, A. H. Meyer, Bessie Noyes, A. E. Reynolds, J. E. Seybert, W. Shepherdson.
- Necrologist*: W. E. Edington, DePauw University.
- Nominations*: (Announced at the November meeting of the Academy).
- Program*: Chairman, Willis H. Johnson, Wabash College; A. R. Bechtel, Crawford Polley, R. E. Martin, L. B. Howell, John E. Potzger, Scott McCoy, Alton A. Lindsey.

Publication of Proceedings: Chairman, E. S. Gantz, Purdue University; R. C. Corley, Paul Weatherwax, P. D. Edwards.

Relation of Academy to State: Chairman, F. N. Wallace, Department of Conservation; H. J. Reed, Eli Lilly, J. S. Wright, Daniel Den Uyl.

Representative on Council of A.A.A.S.: Paul Weatherwax, Indiana University.

Resolutions: Chairman, Stephen Visher, Indiana University; Arthur T. Guard, Howard Ray Youse.

MINUTES OF THE EXECUTIVE COMMITTEE

CRAWFORDSVILLE, NOVEMBER 3, 1949

The executive committee was called to order by C. L. Porter in the Library Building at 7:30 p. m. The minutes of the spring meeting held at Clifty Falls State Park were read and approved. The report of the officers and committee representatives were presented and accepted as follows:

Academy Trustees. John S. Wright, chairman of the Trustees of the Foundation Fund, reported as follows for the year 1948-49:

Balance from the Previous Year	\$375.01
Total Receipts	165.75
	\$540.76
Expenditures:	
The Union Trust Co., fee 5% on \$165.75.....	\$8.29
	\$532.47

Assets in the Fund as of September 30, 1949

(5) \$1,000.00 U. S. Savings Bonds Series "D"—Cost	\$3,750.00
\$6,900.00 U. S. Treasury Bonds Series "G"—Cost.....	6,900.00
(6) Shares Standard Oil of Indiana common stock Par	150.00
	\$10,800.00

Treasurer. Final report of the treasurer, W. P. Morgan, for the year 1949:

Receipts

Balance on hand January 1, 1949.....	\$1,950.17
Dues and initiation fees.....	1,189.00
Designated gifts	450.00
Publications sold	49.12
Authors' reprints Vol. No. 54.....	3.22
Authors' reprints Vol. No. 57.....	358.44
Authors' reprints Vol. No. 58	299.70
	\$4,299.65

Disbursements

1—Program Committee	\$ 304.83
2—Editor Vol. No. 58.....	125.86
3—Expenses of Secretary.....	224.36
4—Expenses of Treasurer.....	106.50
5—Mailing Proceedings	136.28
6—Stationery	69.73
7—Publications for Library	20.00
8—Preparation of 10-Year Index	4.98
9—Bookwalter Co., balance on Vol. No. 58	119.83
10—Jr. Academy expenses	20.72
11—Authors' reprints Vol. No. 58.....	699.29

12—Author award 1949 Tom Daggy.....	25.00
13—Author award 1949 Helen Marsh Zeiner ..	25.00
14—C. P. Hickman research grant.....	37.50
15—A. E. Reynolds research grant.....	18.75
16—Returned checks	5.06
17—Expenses to five officers as directed by action of 1947 Executive Committee....	100.00
18—S. S. Visser*.....	300.00
	<hr/>
	\$2,343.69
**Balance on hand	1,955.96
	<hr/>
	\$4,299.65

* Drawn for use in preparation of material for "Indiana Men of Science" shown in 1949 records due to delay in closing accounts of that year.

** Balance includes \$800.00 designated for the preparation for publication of the "Indiana Men of Science."

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

(Signed) KARL S. MEANS, S. E. ELLIOTT, *Auditors*.

Auditing Committee. The treasurer's report was audited and approved by the committee. The Statement of the Union Trust Company as to the Society's account and holdings was checked by the trustees and the chairman of the auditing committee.

(Signed) KARL S. MEANS, *Chairman*.

Bonding Committee. Ray C. Friesner, Chairman, reported that the Academy carries with Hartford Accident and Indemnity Company a bond in the amount of \$2000.00 for the Treasurer and \$5000.00 each for the Trustees. These are on a position basis. The bond is renewable triannually at a total cost of \$62.50 for the three-year period. The next expiration date is November 18, 1950, and the bond will be renewed on or before that time unless the Academy should instruct the committee otherwise.

Editor and Publication of Proceedings. In the absence of E. S. Gantz no report was made by this committee. However, Dr. Friesner reported that he had ordered the reprints needed by the State Floral Committee which would amount to about \$15. A motion was carried that the Academy bear this expense.

Research Grant. Dr. T. G. Yuncker reported that no requests for grants have been received by the Committee during the past year. Grants made previously to Prof. Drummond of Indiana State Teachers' College, Prof. Hickman of DePauw University, Prof. Reynolds of DePauw University, and Prof. Thrun of Valparaiso University have been continued during the year and installments paid as progress reports were received and approved by the Committee.

Biological Survey. W. E. Ricker reported activities in faunistic and floristic studies continues along much the same lines as reported last

year. Drs. L. C. Cole and H. H. Vogel, being no longer resident in Indiana, have asked to be relieved of their position upon the Committee.

Ten-Year Index. Chairman Friesner made the following report:

1. Indexing of volumes 51-58 is complete and has yielded about 8500 entries.
2. Printing cost of 10-year index will be approximately \$600.
3. It is recommended that the index for volumes 51-60 be bound in volume 61.
4. Volumes containing 10-year indexes should be bound in red cloth instead of the usual black.
5. Format should be the same as for the 50-year index.

Library. Chairman Nellie M. Coats reported that a revision of the 1935 list has been prepared for distribution at the 1949 fall meeting. This 1949 edition records five hundred one titles, a gain of two hundred seventy. This fiscal year the State Library as agent has mailed copies of two issues of the Proceedings, v. 57 published Dec. 2, 1948 and v. 58 published Oct. 29, 1949, the latter having just been posted to nine hundred six members.

Press Secretary. Dr. W. A. Daily reported news items concerning the meetings of the Academy has been presented to the journal "Science", Indianapolis newspapers and "Newsweek". Printed announcements suitable for posting were sent out to all the colleges and universities in the state. All of the high schools that have had at any time a chapter of the Junior Academy also received a notice. The archives of the Academy are in good condition and a complete series of presidential photographs are on file. Mr. Charles C. Deam of Bluffton has presented to the State Library the major part of his scientific correspondence which covers a period of nearly fifty years.

Junior Academy of Science. Howard H. Michaud, Chairman, presented the following report. There are at present twenty-six active Junior Academy of Science Clubs representing twenty-three Indiana high schools. Two new clubs were added beginning with this school year. An excellent news-letter of club activities was prepared and distributed again last year. A more genuine interest in the Junior Academy and science clubs has been stimulated through the Indiana State Science Talent Search. This is a cooperative effort between the Indiana Junior Academy of Science, Science Clubs of America and the Indianapolis Times. The renewed interest of the clubs is very encouraging and surely proves the value of working with our future potential scientists. An excellent program has been prepared for Saturday's meeting.

Indiana Science Talent Search Committee. Ralph W. Lefler, chairman, explained the work of his committee in setting up rules and regulations for the Senior Science students of Indiana in competing for the awards offered by the Indianapolis Times. This was an excellent report and

was accepted with thanks. In addition, Dr. Lefler presented the following on the relation of Indiana colleges to the Science Talent Search:

The necessity for the early identification and for the continued development of our talented in all fields has long been recognized. In the field of science there have been programs both local and national in scope which tended to encourage the more talented to strive for some reward, usually a scholarship. The Science Talent Search conducted by Science Service for the Westinghouse Scholarships is one of the most outstanding of such attempts.

This Search with the concurrent fifteen state searches brings untold encouragement to all who participate. There are each year 40 National Winners and 360 National Honorable Mentions. In addition 294 students were honored last year in the 15 state searches. 20 of these were from Indiana.

The rigorous selection procedure which requires an essay on an original project and the completion of a three hour Science Aptitude Examination is a maturing and desirable experience for any serious minded high school senior.

All Indiana Winners are recommended to the admissions officers and scholarship committees of our Indiana colleges and universities. It is sincerely hoped that no really talented student will have to terminate his program of education because of inability to bear the financial obligation.

The attendance of Indiana Scientists at the Junior Scientists Assembly held each spring as the culminating activity of the Indiana Science Talent Search will make possible personal interviews with these students and provide opportunity for appropriate encouragement in the field best suited for their continued study.

Relations of Academy to State. Frank N. Wallace, chairman, reported that there has been no change in the status of the state appropriations for the Indiana Academy of Science. There are \$3000.00 available this year for the publication of the proceedings. "I checked with the auditor, and so far there has been no commitment made on this, so the entire \$3000 is available for this year's publications."

Relation of Academy to A.A.A.S. E. F. Degering reported that he had attended the A.A.A.S. in Washington, but found few representatives from Indiana.

Nominating. C. A. Behrens reported that his committee is recommending the following members for fellows: W. A. Daily, Eli Lilly and Butler University; R. W. Lefler, Purdue University; Preston McGrain, U. S. Flood Control; Daniel Den Uyl, Purdue University; L. H. Baldinger, Notre Dame University.

Program. W. H. Johnson reported that some sectional meetings would be long. The program would proceed as scheduled.

New Business. It was moved and carried that Dr. T. G. Yuncker be re-elected as a member to the Research Grants Committee. The members of the present bonding committee were unanimously re-elected for another year.

Dr. W. E. Edington, chairman of the committee on "Indiana Men of Science", recommended that the committee be discharged and a new

committee on arranging for compiling and publication be appointed as suggested in a Resolution to be presented at this meeting by Dr. John S. Wright. Dr. Wright presented the following resolutions:

WHEREAS: Scientific activities in Indiana began over a century ago and include significant contributions to the advancement of science, the Indiana Academy of Science believes it desirable and in furtherance of scientific and educational interests to prepare an historical account of science in our state, including biographical records of the men and women of science, past and present, who originated, studied or worked in Indiana, and to do this as speedily as consistent with sound procedure, be it

RESOLVED:

(1) That the president be authorized to appoint a committee of two or more members to study the ways and means for preparing the text for and the publication of such a history.

(2) That the committee be empowered to add to its membership if it so desires.

(3) That the committee be allowed an amount not exceeding four hundred (400) dollars for the first year's work, to be paid out of the treasury's "designated fund," contributed for special publication projects.

(4) That the committee report at the next annual meeting with recommendations for further procedure.

The resolutions were unanimously adopted. President Porter announced that he would appoint a committee.

Dr. R. E. Martin issued an invitation for the Academy to hold its next annual meeting at Hanover College.

The problem of raising the dues was raised and discussed at length. Dr. Friesner then moved that the chair appoint a committee to study the problem of dues and report its recommendation at the next annual meeting. The motion carried and President Porter appointed the following committee: R. C. Friesner, W. E. Edington, Howard Michaud, W. P. Morgan (ex officio).

The meeting adjourned at 9:30 p. m.

MINUTES OF THE GENERAL SESSION

CRAWFORDSVILLE, NOVEMBER 4, 1949

President Frank H. Sparks of Wabash College expressed his appreciation for having the Academy as guest of the college at its sixty-fifth meeting. The response to the welcome was given by President C. L. Porter.

The minutes of the Executive Committee meeting was read by the secretary and approved by the Academy.

President Porter appointed W. E. Edington, J. S. Wright, S. S. Visser, M. G. Mellon and Paul Weatherwax as a committee on the History of Science in Indiana as provided in the resolutions presented by John S. Wright at the executive committee meeting.

Dr. Will E. Edington, chairman of the Necrology committee, presented the list of those members who had died during the year. The names presented were: Benjamin H. Grove, Carl F. Hanske, Thomas F. Hargitt, G. Donald Klopp, and David A. Rothrock.

Dr. Harry J. Fuller, University of Illinois, presented an interesting illustrated talk on "Ancient and Modern Life in the Andes Mountains". The primitive methods used by the people in this region of South America and the ancient ruins were very impressive.

Duane Roller, Wabash College, read a well prepared paper entitled "Some Difficulties in Interpreting Basic Factors in the Relations of the Sciences to Society". The author expressed the Marxist attitude which regards science solely as a social instrument had reached what seems to be an incompatible conflict with the idea of freedom for "pure" scientific research.

C. M. Palmer, Butler University, gave an illustrated talk "The U.N.E.S.C.O. Science Office of South Asia". Dr. Palmer had spent two years in India as a representative of the Friends helping to improve methods in agriculture.

The meeting adjourned at 11 a.m. to meet in the various sections.

Luncheon was served in the Crawfordsville Armory with 345 present.

At the annual dinner in the Masonic Temple the Wabash College male quartet sang several appropriate numbers.

H. B. Howell presented the names of 107 applicants for membership. These were duly elected.

Prof. C. A. Behrens of the nominating committee presented the following names for fellows: W. A. Daily, Eli Lilly Co.; L. H. Baldinger, Notre Dame; R. W. Lefler, Purdue University; Preston McGrain, Indiana Flood Control and Water Resources Commission, Indiana; Daniel Den Uyl, Purdue University. These persons were unanimously elected.

The Divisional Chairmen who were elected to serve the various sections for 1950 were as follows: Anthropology, Harold E. Driver, Indiana University; Bacteriology, H. Koffler, Purdue University; Botany, M. S. Markle, Earlham; Chemistry, Kieth Seymour, Butler University; Entomology, George Gould, Purdue University; Geology and Geography, Otis P. Starkey, Indiana University; History of Science, M. G. Mellon, Purdue University; Mathematics, Walter H. Carnahan, Purdue University; Physics, Duane Roller, Wabash College; Psychology, Robert Bruce, Wabash College; Zoology, Sears Crowell, Indiana University.

P. D. Edwards reported for the awards committee as follows:

The fields of science selected for 1949 are anthropology and entomology. The Eli Lilly prize in anthropology is awarded to Mrs. Helen Marsh Zeiner of Denver, Colorado, for her paper entitled "Botanical Survey of the Angel Mounds" which appeared in Vol. 54. The J. J. Davis prize in entomology is awarded to Tom Daggy of Olivet College, Olivet, Michigan for his paper entitled, "Notes on the ecology and taxonomy of certain pupae of the family Tenebrionidae (Coleoptera)" which appeared in Vol. 56.

C. A. Behrens of the nominating committee recommended the following persons for the 1950 officers:

President	S. S. Visher, Indiana University
Vice-President	O. B. Christy, Ball State
Editor	A. A. Lindsey, Purdue University
Secretary	W. A. Daily, Eli Lilly Co.
Treasurer	W. P. Morgan, Indiana Central College
Press Secretary	Preston McGrain, Indiana Flood Control

This recommendation was approved and the officers unanimously elected.

An invitation to meet at Hanover College in 1950 was accepted.

Dr. S. S. Visher, chairman of the resolutions committee, read the following report:

The Academy expresses appreciation to the Program Committee, chairman Willis H. Johnson, A. R. Bechtel, L. B. Howell, Alton A. Lindsey, R. E. Martin, Scott McCoy, Crawford Polley, and John E. Potzger for their earnest efforts to make this meeting the success it has been.

The arranging for places of meeting of the various sections, committees and the entire academy and for the meals and lodging is a far larger job than those who have never done it realize. The Academy is under special obligation to Chairman Willis Johnson for much devoted service.

To Wabash College, we are grateful for kind hospitality. Everytime that the Academy meets here, we have increased reason to appreciate this splendid college, which has for many decades contributed much to the educational life of Indiana.

The Academy also expresses appreciation for the devoted services of O. B. Christy as secretary, who after several years of service finds it necessary to retire.

Vice-President S. S. Visher presented President C. L. Porter who read an excellent paper on "Responsibilities of a Mycologist."

The Sixty-Fifth Annual Meeting of the Indiana Academy of Science with 430 registrants, 345 attending the luncheon, and 177 the dinner, was adjourned.

O. B. CHRISTY, Secretary.

NEW MEMBERS OF THE YEAR 1949,
INDIANA ACADEMY

- Alexander, Raymond L., 5020 E. Iowa St., Indianapolis. B
Anthonisen, Robert P., 8011 S. Muskegon Ave., Chicago 17, Ill. G, Geo
Beecher, A. B., Journal-Review Office, Crawfordsville. B
Blackburn, Jack B., 224 Waldron St., W. Lafayette. Highway Engr
Blasingham, Miss Emily Jane, Anthropology Museum, Indiana Univ.,
Bloomington. A
Blumenthal, Harold Jay, Dept. of Biological Sciences, Purdue Univ.,
Lafayette. Ba
Bohman, Frank E., 46 Newport Ave., W. Hartford 7, Conn. E
Boling, Richard C., 2830 Brookside Ave., Indianapolis. Z
Buck, Dr. Miriam G., 798 N. Walnut St., Franklin. C
Buser, Franklin B., D-20 Woodlawn Courts, Bloomington. Bo
Buss, Arnold H., Psychology Dept., Indiana Univ., Bloomington. Psych
Canright, Dr. James E., 1604 E. University St., Bloomington. Bo
Carpenter, T. R., Dept. Bot. and Pl. Path. A.E.S., Purdue Univ.,
W. Lafayette. Pl Path
Chamberlin, Miss Lois, Dept. of Botany, Purdue Univ., W. Lafayette. Bo
Clemmons, George E., 6811 Anthony Ave., Chicago, Ill. G, Geo
Coulter, Miss Kathryn E., 211 S. 12th St., Richmond. B
Crandall, Richard B., 611 Ridge Ave., Greencastle. Z
Crawford, Dr. Wiley W., 635 S. Englewood Drive, Evansville. B, Z
Cummings, Robert H., 432 N. Grant St., W. Lafayette. Mycol
Curry, Miss Hilda J., Route 6, Bloomington. A
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Day, Richard E., Dept. of Biology, Purdue Univ., W. Lafayette. Mycol
Daykin, P. N., Dept. Physics, Purdue Univ., W. Lafayette. P
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DeLanney, Dr. Louis E., 900 S. Grant Ave., Crawfordsville. Z
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Driver, Dr. Harold E., Anthropology Dept., Indiana Univ., Bloomington. A
Ducommun, Dale J., Sigma Nu House, Greencastle. Z, Psych
Eliason, Miss Alma E., Richmond Sr. High School, Richmond. B
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Finnegan, Cyril V., Wabash College, Crawfordsville. Z, Embry
French, Richard C., Dept. Biological Sciences, Purdue Univ., W. Lafayette. Pl Physio
Fry, Prof. Cleota G., 213 Varsity Apt., W. Lafayette. M

Geyer, Prof. J. Hubert, 38 S. Edwards St., Franklin. Z
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 Greenspoon, Joel, Psychology Dept., Science Hall, Indiana Univ., Bloomington. Psych

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 Hilliker, Eugene F., Shortridge High School, Indianapolis.
 Hoffman, Max Norman, Route 2, Cory. B, C
 Hovorka, Edward J., 314 E. 6th St., Bloomington. Psych
 Hughes, Dr. Howard K., 617 Dodge St., W. Lafayette. M
 Huse, Erle S., Hanover College, Hanover. C
 Hurst, Mrs. Fannie Mae, Dept. of Biology, Purdue Univ., W. Lafayette. Bo

Johnson, Miss Laveta Audrey, 4315 Cold Spring Rd., Indianapolis.
 Johnson, Dr. Vivian A., Dept. Physics, Purdue Univ., W. Lafayette. P
 Judson, Dr. James Edward, 286 Forsythe St., Franklin. Ba, Bo

King, Roger F., 524 N. Jefferson St., Madison. Ba, Myco

LaCroix, J. Donald, Purdue Univ., W. Lafayette. Bo
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 Leforge, Prof. Jesse H., 434 N. Grant St., W. Lafayette. Bo, Agro
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 Livesey, Dr. Robert L., Univ. of Notre Dame, Notre Dame. B
 Luck, John Virgil, Purdue Univ., W. Lafayette. Ba, My

Maatman, Prof. Russell W., Chem. Dept. DePauw Univ., Greencastle. C
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 Maysilles, Prof. James H., Dept. Botany, Hanover College, Hanover. Bo
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 Mindach, Fred Carl, 951 W. 20th St., Box 855, Indianapolis. Bo, Ba
 Mockford, Edward L., 4140 Graceland Ave., Indianapolis. Z
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Nichols, Kenneth E., Valparaiso Univ., Valparaiso. B

Opp, Edward D., Purdue Univ., W. Lafayette. Bo
 Ort, Robert Stanley, Psych. Dept., Wabash College, Crawfordsville. Psy
 Overmyer, Robert, 10001 S. Hoyne Ave., Chicago 43, Ill. P

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 Peterson, Dr. J. B., 633 Russell St., W. Lafayette. Agro

- Pierard, Louis H., P.O. Box 461, 3d Observation Ct., Greencastle. G
 Powelson, Prof. Dorothy M., Dept. of Biological Sciences, Purdue Univ.,
 W. Lafayette. B
 Punke, Miss Helen, Evansville College, Evansville. B
 Pursell, Lyle E., Route 3, Paola, Kans. M
 Quinn, Miss Charlene M., 407 Howard St., Greencastle. Z
 Reddix, Lloyd E., Indiana Central College, Indianapolis. P
 Rice, Michael W., 215 Longden Hall, Greencastle. P
 Rieke, Dr. Foster F., Dept. Physics, Purdue Univ., W. Lafayette. P
 Roberts, Carroll N., Dept. of Geology, Indiana Univ., Bloomington. G
 Rohrer, Charles St., Chem. Dept. Indiana Univ., Bloomington. C
 Rueve, Rev. Charles R., St. Joseph College, Collegeville. M
 Schipper, Dr. Arthur L., Univ. of Notre Dame, Notre Dame. B
 Schneller, Miss Myrtle V., Dept of Zoology, Ind. Univ., Bloomington.
 Schuder, Donald L., Dept. of Ento. A.E.S. Annex, Purdue Univ., W. La-
 fayette. E
 Seifert, Dr. R. L., Dept. Chem., Indiana Univ., Bloomington. C
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 yette. E
 Spencer, Dr. Joseph Nuten, 2141 S. 7th St., Terre Haute. Phy, Phar
 Springer, Clifford H., 333 W. Sherwood Terrace, Ft. Wayne 6. M
 Stark, Ralph W., 122 S. Lebanon St., Lebanon. Bo
 Stark, William Max, Stanley Coulter Hall, Purdue Univ., W. Lafa-
 yette. Ba
 Stearns, Forest, 515-3 FPHA, W. Lafayette. Bo
 Stuntz, Edgar Cheadle, Sigma Chi House, Crawfordsville. Psy
 Sybil, Dr. Edward, Jr., Dept. of Biology, Univ. of Notre Dame, Notre
 Dame. Bo
 Thevathasan, Oliver, Florence Hall, Greencastle. Z
 Trabant, Prof. E. A., 215 Forest Hills Dr., W. Lafayette. M
 Treece, Prof. Walter A., Apt. 12-B, 500 S. Rotherwood, Evansville. Geog
 Uhrhan, Miss Jane A., 3005 Broadway, Indianapolis. M
 Walerstein, Dr. I., 1334 Vine St., W. Lafayette. P
 Warner, Dr. Glen W., Lakeville.
 Webster, Dr. J. Dan., Hanover College, Hanover. Z
 Whaley, Dr. R. M., 19 David Ross Rd., W. Lafayette. P
 Willis, Myron J., State St., Ct. B No. 30, W. Lafayette. M
 Woods, Prof. Kenneth B., 902 N. Chauncey Ave., W. Lafayette. Geog
 Young, Charles Edward, FPHA 318-3, W. State St., W. Lafayette. M, P
 Young, Dr. Frank N., Jr., Dept. of Zoology, Indiana Univ., Bloomington.
 Zieman, Dr. Clayton, 314½ W. Main, Crawfordsville. P

JUNIOR ACADEMIES

Science Club of Senior High School, Whitewater Bldg., Richmond. P, C, B
Science Club, Huntingburg High School, Wilmer K. Pellett, sponsor,
Huntingburg. G. S

Morton Science Club, 7040 Marshall Ave., Hammond

Photography, area of biological sciences

INDIANA JUNIOR ACADEMY OF SCIENCE

Officers for 1949:

President: RICHARD ELZAY, Phi Chem Club, Elmhurst High School, Fort Wayne.

Vice-President: Tom Moon, Junior Academy, Central High School, South Bend.

Secretary: MARJORIE TAPSCOTT, Biology Club, New Castle Senior High School, New Castle.

PROGRAM OF THE SEVENTEENTH ANNUAL MEETING

Saturday, November 5, 1949

Waugh Hall, Wabash College, Crawfordsville, Indiana

9:00-10:00 A.M. Exhibits, Room 101, Waugh Hall

10:00 A.M. Morning Session, Room 1, Waugh Hall

Richard Elzay, presiding.

Greetings, Dean B. K. Trippet, Wabash College.

Program presented by club members:

1. Plastic Microscope Slides—Kay Boese, Nature Study Club, Arsenal Technical High School, Indianapolis.

2. Hybridizing Roses at Hill's Greenhouse—Robert Milligan, Science Club, Richmond High School, Richmond.

3. Rabbit Royalty—Mary Martha Curd, Nature Study Club, Arsenal Technical High School, Indianapolis.

4. Bird Population Study (Illustrated)—Marjorie Tapscott, Biology Club, New Castle Senior High School, New Castle.

5. Interesting Facts About Astronomy—Robert Usher, Biology Club, New Castle Senior High School, New Castle.

6. The Water Problem of South Bend—Tom Moon, Junior Academy, Central High School, South Bend.

7. Gems of the Ocean—Mary Jane Patrizi, Biology Club, Lew Wallace High School, Gary.

8. Demonstration—Vandegraff Generator—Tom Miller and John Goodman, Science Club, Mishawaka High School, Mishawaka.

9. Bird Adaptations—Judith Douthitt, National Scientific Honor Society, Bloomington High School, Bloomington.

10. What Will a Frog Heart Do? (Demonstration)—Tao Yuan Chen, Chemistry Club, Shortridge High School, Indianapolis.

12:30 P.M. Junior Academy Luncheon

First Baptist Church

Miss Audrey Johnson, Scientific Honorary Student, Purdue University, and one of the last year's National Science Talent Search Winners will speak on "Experiences as a National Winner in Washington, D.C."

1:45 P.M. Room 1, Waugh Hall

11. How to Make a Bird Identification Board—Bill Zander, Biology Club, Lew Wallace High School, Gary.

12. Destruction of Wildlife on Our Highways—Kelly Wise, Biology Club, New Castle Senior High School, New Castle.

13. Out of the Past (Illustrated)—Bill Luckey, Junior Academy, Elkhart High School, Elkhart.

14. Somatotyping—Jim Heuston, Science Club, Howe High School, Indianapolis.

15. Geology Field Trip—Vivian Shilling, Chemistry Club, Shortridge High School, Indianapolis.

16. Additional Investigations of a High Frequency Oscillator—Charlie Bob Ellis, University High School, Bloomington.

17. Pathogenic Mold—Watson Laetsch, Science Club, Howe High School, Indianapolis.

MINUTES

The seventeenth annual meeting of the Indiana Junior Academy of Science was held Saturday, November 5, 1949, in room 1 of Waugh Hall, Wabash College, Crawfordsville, Indiana.

The exhibit room opened at 9:00 a.m. Exhibits and demonstrations were displayed by a number of individuals and clubs.

The general session was opened by President Richard Elzay, Phi Chem Club, Elmhurst High School, Fort Wayne. Tom Moon, Jr., Academy, Central High School, South Bend, and Marjorie Tapscott, Biology Club, New Castle High School, were introduced as vice president and secretary, respectively. Following these introductions, the president welcomed the new clubs. These new members of the Junior Academy are Richmond, Hammond, and Huntingburg High Schools. Due to a shortage of the time, the officers dispensed with the reading of the previous year's minutes. Next Dean B. K. Trippet, Wabash College, welcomed the Junior Academy of Science and told of the contributions to

science made by Wabash College. Mr. David Wells, sponsor of the Crawfordsville High School Science Club, announced plans for the luncheon to be held in the First Baptist Church. Then the president introduced Professor Howard H. Michaud, State Sponsor, who conducted a short memorial service in honor of G. Donald Klopp. Mr. Klopp, a member of the Junior Academy Council, died on May 30, 1949.

Kay Boese, Nature Study Club, Arsenal Technical High School, Indianapolis, opened the morning program with a talk on plastic microscope slides. She discussed the various methods of preparation and the advantages of using plastic microscope slides.

"Hybridizing Roses at Hill's Greenhouse" was the topic presented by Robert Milligan, Richmond Senior High School Science Club. After reviewing the reproductive parts of the flower, he took roses and demonstrated methods used in hybridizing plants. Several real roses were shown as good examples of flowers produced through hybridization.

Another representative from Arsenal Technical High School's Nature Study Club gave a talk on "Rabbit Royalty." Mary Martha Curd discussed the histories of our domestic rabbits and showed their present day importance in the study of medicine and genetics.

Marjorie Tapscott of the New Castle High School Biology Club gave a report of a beech-maple woods. A colored movie was shown to illustrate the methods used in making a bird population study.

Robert Usher, also of the New Castle High School Biology Club, gave a talk entitled, "Interesting Facts About Astronomy." He explained some of the ancient beliefs about the solar system and how they compare with present day scientific knowledge.

The water problem of South Bend was presented by Tom Moon, South Bend Central High School. After discussing ways of obtaining and purifying water, he mentioned the methods used in testing water.

Using her own shell collection as an example, Mary Jane Patrizi, Biology Club, Lew Wallace High School, Gary, demonstrated how shells can be used in making jewelry.

Two boys from the Science Club of Mishawaka High School demonstrated their home-made Vandegraff Generator. Tom Miller and John Goodman told how the generator was made and how it performs. They expressed a desire to make a new, improved generator in the future.

Next Judith Douthitt, Bloomington High School Scientific Honor Society, presented colored bird slides she had made. While showing the slides, she discussed the various characteristics of several common birds found in Indiana.

The last talk scheduled for the morning session was given by Tao Yuan Chen, Chemistry Club, Shortridge, Indianapolis. In searching for the ideal cardiac drug, he has experimented with a number of drugs. Using live frogs he demonstrated the actual effect of various drugs on the heart beat of the frog. Since the audience could see the heart beats being traced on a kymograph, they were able to understand the variation caused by the different drugs.

At the close of the morning program, President Richard Elzay conducted the election of officers for the coming year. The following students were elected: President: Tom Moon, Junior Academy, South Bend Central High School; Vice President: Sue Schaffner, Chemistry Club, Shortridge High School, Indianapolis; Secretary: Marilyn Beckett, New Castle High School Biology Club.

Professor Howard Michaud closed the meeting with an announcement concerning the new council members. He stated that Mr. Harold Stewart, Bloomington High School, and Mr. A. L. Smith, South Bend Central High School, were to be added to the council.

The morning session was closed at 12:30 p.m. A number of Junior Academy members and sponsors attended the Junior Academy luncheon held at the First Baptist Church in Crawfordsville.

At the luncheon Dr. R. W. Lefler from Purdue gave a brief explanation of the Science Talent Search plans for this year. He then introduced Miss Audrey Johnson, Purdue University, who related her experiences in Washington, D. C. as a Science Talent Search Winner.

Following the luncheon, the group returned to the Wabash College campus where the meeting was resumed in Waugh Hall. The afternoon session was called to order at 2:00 p.m.

"How to Make a Bird Identification Board" was the topic presented by a representative of the Biology Club at Lew Wallace High School, Gary. Bill Zander showed how such a board could be wired for general use in the laboratory.

The second speaker of the afternoon was Kelly Wise, New Castle High School Biology Club. While discussing the destruction of wildlife on our highways, he showed colored slides of the animals often killed. The general trend of his records showed that the English sparrow, rabbit, and the opossum were killed most frequently.

"Somatotyping" was the topic presented by Jim Heuston, Science Club, Howe High School, Indianapolis. He explained how the body build of a human being somewhat determines the characteristics of his personality.

Vivian Schilling, Shortridge Chemistry Club, Indianapolis, described a geology field trip taken by a group of high school students. While showing pictures of the ancient animal fossils, she named the areas where these fossils could be found. Gastropods, crinoids, and brachiopods were several of the more common fossils located by the group.

Charlie Bob Ellis, Junior Academy of Science, University High School, Bloomington, presented the next topic. By using an oscillator, he showed the group how radio waves are transmitted through the air.

The last speech of the afternoon was given by Watson Laetsch, Science Club, Howe High School, Indianapolis. He discussed his experiments in culturing pathogenic molds found on the human body.

Several student representatives from various science clubs gave suggestions to the group for planning money-making projects.

President Richard Elzay then turned the meeting over to Professor Howard Michaud who announced the winners of the best girl and best boy titles. Judith Douthitt, Bloomington High School National Scientific Honor Society, was chosen to be "Outstanding Girl." The title of "Outstanding Boy" went to Tao Yuan Chen, Chemistry Club, Shortridge High School, Indianapolis.

Following these announcements, President Richard Elzay adjourned the meeting at 4:00 p.m.