

PROCEEDINGS

of the

Indiana Academy
of Science

Founded December 29, 1885

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Volume 62

1952

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BENJAMIN MOULTON, EDITOR

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Spring Meeting

May 23-24

INDIANA DUNES STATE PARK

Fall Meeting

October 16-18

VALPARAISO UNIVERSITY

Published at Indianapolis, Indiana

1953

1. **Instructions for Authors** appear at end of this volume, p. 331.
2. **Exchanges.** Items sent in exchange for the Proceedings and correspondence concerning exchange arrangements should be addressed:

Indiana Academy of Science, Library
c/o State Library, Indianapolis 4, Indiana
3. **Proceedings** may be purchased through the State Library at \$3.00 per volume.
4. **Reprints of technical papers** can often be secured from the authors. They cannot be supplied by the State Library nor by the officers of the Academy.
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 Library.
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 1952

OFFICERS

President.....P. D. EDWARDS, Ball State Teachers College
Vice-President.....H. M. POWELL, Eli Lilly and Company
Secretary.....W. A. DAILY, Eli Lilly and Company
Treasurer....F. J. WELCHER, Indiana University Adult Education Center
Editor.....A. A. LINDSEY, Purdue University
Press Secretary.....BENJAMIN MOULTON, Butler University

DIVISIONAL CHAIRMEN

Anthropology, MRS. GEORGE F. MARTIN, Evansville
Bacteriology, R. C. BARD, Indiana University
Botany, H. R. YOUSE, DePauw University
Chemistry, E. L. HAENISCH, Wabash College
Entomology, F. N. YOUNG, Indiana University
Geology and Geography, T. BARTON, Indiana University
History of Science, R. E. GIRTON, Purdue University
Mathematics, E. HOPF, Indiana University
Physics, ARNIM HUMMEL, Ball State Teachers College
Psychology, L. M. BAKER, Purdue University
Zoology, F. R. ELLIOTT, Valparaiso University

EXECUTIVE COMMITTEE

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

L. M. Baker, R. C. Bard, T. Barton, N. M. Coats, W. A. Daily,
J. J. Davis, C. C. Deam, E. F. Degering, W. E. Edington, P. D. Edwards,
F. R. Elliott, H. E. Enders, R. C. Friesner, R. E. Girton, E. L. Haenisch,
C. B. Heiser, E. Hopf, W. H. Johnson, T. K. Just, J. S. Karling, A. A.
Lindsey, R. W. Lefler, Eli Lilly, J. F. Mackell, M. S. Markle, Mrs. G. F.
Martin, M. G. Mellon, A. H. Meyer, H. H. Michaud, W. P. Morgan,
B. Moulton, F. Payne, C. L. Porter, H. M. Powell, R. R. Ramsey, D. Roller,
S. S. Visher, F. N. Wallace, Paul Weatherwax, Winona Welch, F. J.
Welcher, F. N. Young, H. R. Youse, T. G. Yuncker, C. M. Zieman.

BUDGET COMMITTEE

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

P. D. Edwards, W. A. Daily, F. J. Welcher, A. A. Lindsey, H. H.
Michaud, N. M. Coats, A. H. Meyer 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 1952); 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 (1952), M. G. Mellon (1955), Paul Weatherwax (1956), Mason Hufford (1953), P. D. Edwards and W. A. Daily (ex officio).

STANDING COMMITTEES

(Appointed by the President, Chairmen named first)

Auditing: Chairman, W. P. Morgan, Indiana Central College; S. E. Elliott.

Biological Survey: Chairman, C. B. Heiser, Indiana University; W. P. Allyn, W. B. Barnes, H. J. Brodie, F. K. Daily, H. O. Deay, S. D. Gerking, H. H. Michaud, Winona Welch, Frank Young.

Index: Chairman, Ray C. Friesner, 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; M. S. Markle, O. B. Christy, Naomi Mullendore Hougham.

Junior Academy: Chairman, H. H. Michaud, Purdue University; Walter Carnahan, N. E. Adams, R. Niswander, R. McDougal, J. E. Potzger, J. L. Coopridge, P. L. Whitaker, R. E. Martin, R. Cooper.

Library: Chairman, N. M. Coats, State Library; R. C. Friesner, W. G. Gingery, Glenn Black.

Membership: Chairman, R. E. Girton, Purdue University; Rev. C. P. P. S. Baechle, Juna Beal, S. R. Esten, M. R. Garner, D. G. Graam, W. H. Headlee, G. H. Hennion, C. P. Hickman, R. L. Hicks, L. B. Howell, Z. D. Hurlbut, J. L. Hyatt, C. E. Kaslow, M. W. Keller, E. Kintner, G. D. Koch, D. E. Miller, A. Strickler, W. E. Thrun.

Necrologist: W. E. Edington, DePauw University.

Nominations: Chairman, Paul Weatherwax, Indiana University; R. C. Friesner, M. G. Mellon, W. P. Morgan.

Program: Chairman, A. H. Meyer, Valparaiso University; Benjamin Moulton, Frank R. Elliott, E. J. Buls, R. G. Larson, A. R. Thomas, R. C. Waldschmidt, Carl H. Krekeler.

Publication of Proceedings: Chairman, A. A. Lindsey, Purdue University;
R. C. Corley, Paul Weatherwax.

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 Johnson, Wabash College.

Resolutions: Chairman, T. G. Yuncker, DePauw University; T. W. Torrey, R. L. Shelley.

MINUTES OF THE SPRING MEETING

INDIANA DUNES STATE PARK

DUNES HOTEL

MAY 23-24, 1952

President P. D. Edwards called the Executive Committee meeting to order at 4:45 P. M. in the Dunes Arcade Hotel.

The officers and committees reported as follows:

Treasurer. Frank Welcher gave a report which will appear in Vol. 61 of the Proceedings.

Editor. Alton A. Lindsey reported that all galley proofs had been returned to the printer and that Vol. 61 was within the budget.

Library. In the absence of Chairman Nellie Coats, Ray C. Friesner read her report as follows: At present, 696 titles are received. As a courtesy to the Academy, the Indiana State Library supplied labor for mailing copies of the Visher-Indiana Scientists to members and took charge of sales. In addition to the distribution to institutions on the exchange list, the volume was forwarded to many other Indiana public, college and special libraries and to the Indiana high schools. Complimentary copies were mailed, too, to some of the major libraries outside the state and to members of the boards of the Indiana state supported colleges and universities. Perhaps this list should be expanded to include the trustees of the non-state supported institutions of higher learning. About 1,400 copies of the book remain. Four thousand forty-one copies were printed of which 341 were delivered to Dr. Visher, 3,700 to the Indiana State Library.

Press Secretary. Ben Moulton reported that publicity releases had been made concerning the spring meeting.

Program Committee. A. H. Meyer said that plans were well under way for the fall meeting of 1952.

Junior Academy of Science. In the absence of the Chairman, Prof. Lefler, Dr. Edwards reported that the Science Talent Search for 1951-52 was a fine success.

Membership Committee. A. A. Lindsey reported that 13 applications for membership including 1 Junior Academy had been received.

Old Business.

1. Upon the application from Dr. Rolla Ramsey, it was moved and approved that he become Member Emeritus and receive the Proceedings of the Indiana Academy of Science gratis.

2. Constitution Revision Committee. After a discussion on the question of types of membership, it was suggested that a written report be made at the fall meeting.

New Business.

1. P. D. Edwards reported that Dr. Arnim Hummel would replace C. M. Ziemann as chairman of the Physics Section.

2. It was suggested that the secretary send a telegram containing best wishes to Mr. Charles C. Deam who could not attend the meeting.

All reports were accepted. The meeting adjourned at 5:45 P. M.

Dinner Meeting. Following the dinner in the Pavilion, President Edwards called the short business session to order in the Hotel.

1. The applications for membership were approved.

2. The rank of Emeritus membership was approved for Dr. Rolla Ramsey.

3. Dr. T. G. Yuncker on behalf of the Academy members thanked the Dunes Park and hotel staffs for their hospitality and the Program Committee for its efforts.

Following the business session, excellent illustrated talks were given by Drs. A. H. Meyer, Valparaiso University, and G. E. Olmstead, University of Chicago. Mr. T. P. Amidei showed a film in color of the dunes plant life.

The following morning, hikes were made by members of the Academy, They were led by J. B. Cope, M. A. Forsyth, F. R. Elliott, T. P. Amidei, R. C. Friesner, R. J. Kuster, J. H. Strietelmeier.

One hundred and sixty-seven names were inscribed on the roll of this meeting.

W. A. DAILY,
Secretary.

MINUTES OF THE EXECUTIVE COMMITTEE

VALPARAISO UNIVERSITY, OCT. 16, 1952

The Executive Committee of the 68th session was called to order by Pres. Edwards in Room 15, Kroencke Hall at 7:40 P.M. The minutes of the Spring Meeting, held at Dunes State Park, were read and approved. The reports of officers and committee representatives were presented and accepted as follows:

Academy Trustees. In the absence of Chairman Harger, the secretary reported as follows for the year 1951-52:

Assets as of Oct. 1, 1952	
Total at par or cost.....	\$12,406.00
Cash Balance at the Indiana National Bank.....	840.98

Treasurer. Frank Welcher presented a tentative report for the period from January 1, 1952, to October 15, 1952.

A tentative report for 1951 was published in Vol. 61; so a final report approved by the Auditing Committee at the end of that year follows:

Receipts

Balance on hand January 1, 1951.....	\$1,347.54
Dues and initiation fees.....	1,895.00
A.A.A.S. refund for research grants.....	175.00
Designated gifts.....	8,125.00
Authors' reprints Vol. 55.....	18.48
Authors' reprints Vol. 57.....	65.65
Authors' reprints Vol. 59.....	292.27
Authors' reprints Vol. 60.....	590.66
Publications sold by librarian.....	36.39
	<hr/>
	\$12,545.99

Disbursements

1—Editor Vol. 60.....	\$200.00
2—Expenses of Treasurer.....	100.09
3—Expenses of Secretary.....	120.89
4—Stationery.....	130.00
5—Preparation of the manuscript of Indiana Scientists under the direction of S. S. Visher.....	533.28
6—Program Committee.....	237.42
7—Duane Roller Research Grant.....	37.50
8—Winona Welch Research Grant.....	25.00
9—Kenneth Wagner Research Grant.....	75.00
10—Furniture for Indiana Academy of Science Library.....	410.65
11—Purchase of publications for Indiana Academy of Science Library.....	85.33
12—Binding, Indiana Academy of Science Library.....	299.68
13—Flowers for John S. Wright.....	15.00
14—Author Award 1951, S. S. Visher.....	25.00
15—Author Award 1951, Winona Welch.....	25.00

16—Authors' reprints Vol. 60.....	781.42
17—Junior Academy Expenses.....	20.81
18—Publication and distribution of Indiana Scientists.	6,149.26
19—Expenses to five officers as directed by action of 1947 Executive Committee.....	100.00
20—Returned checks	4.00

	\$9,375.33
*Balance on hand.....	3,170.66

\$12,545.99

*Balance includes the following: \$61.30 designated for use in the preparation of the manuscript for Indiana Scientists; \$1,315.74 designated for use in the publication and distribution of Indiana Scientists; \$14.35 designated for use in purchasing furniture for Indiana Academy of Science Library.

(Signed) FRANK WELCHER, Treasurer

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

A final report for the period January 1, 1952, to December 31, 1952, approved by the Auditing Committee at the end of the year follows:

Receipts

Balance on hand January 1, 1952.....	\$3,170.66
A.A.A.S. refund on research grants.....	300.00
Dues and initiation fees.....	2,032.00
Designated gift	50.00
Publications sold	74.30
Extra pages in Proceedings, Vol. 61, Mrs. Clyde Malott.	260.00
Refund Program Committee expenses.....	4.04
Author's reprints Vol. 59.....	70.89
Author's reprints Vol. 60.....	137.48
Author's reprints Vol. 61.....	439.25

\$6,538.62

Disbursements

1—Editor Vol. 61.....	\$200.00
2—Expenses of Secretary	146.04
3—Expenses of Treasurer	92.58
4—Expenses of President	4.30
5—Mailing Proceedings	76.18
6—Postage Indiana Scientists.....	180.21
7—Stationery	118.25
8—Authors' reprints Vol. 61.....	597.10
9—Junior Academy expenses.....	12.43
10—Binding, Indiana Academy of Science Library.....	500.99
11—Frank Welcher research grant.....	50.00
12—Lois I. Farquarson research grant.....	50.00
13—Benjamin Moulton research grant.....	50.00
14—Winona Welch research grant.....	25.00
15—Publications for library.....	48.16
16—Flowers, Dr. Friesner	15.00
17—Furniture, Indiana Academy of Science Library...	88.65
18—Program Committee	344.81
19—Expenses to five officers as directed by action of 1947 Executive Committee.....	100.00

20—Prize award in Chemistry, Dr. Milton Burton.....	25.00
21—Prize in Zoology, Dr. Theodore Torrey.....	25.00
22—Academy conference A.A.A.S. expenses.....	5.00
23—Returned checks	13.35

	\$2,768.05
*Balance on hand, Jan. 1, 1953.....	3,770.57

\$6,538.62

*Balance includes \$61.30 remaining in treasury from preparation of manuscript for Indiana Scientists and \$1,135.53 from publication and distribution of Indiana Scientists.

(Signed) FRANK WELCHER, Treasurer

(Signed) W. P. MORGAN,
S. E. ELLIOTT, Auditors

Auditing Committee. The auditor's report will appear in Vol. 62 of the Proceedings of the Indiana Academy of Science.

Bonding Committee. Dr. Ray C. Friesner, Chairman, reported that the bond covering the treasurer and the trustees is in good order. The next expiration date is November 18, 1953.

Research Grant. In the absence of Chairman Yuncker, Dr. Weatherwax reported that Dr. Winona Welch has now collected bryophytes in all of the 92 counties in Indiana, and completed determinations of the mosses. Dr. K. A. Wagner continues his studies of the Hepaticae or liverworts of Indiana. No new requests have been made for grants-in-aid from the Academy Research Fund. There is some money available for such grants in the fund.

Editor and Publication of Proceedings. Dr. A. A. Lindsey reported that the regular text comprising 307 pages was followed by an appendix including the complete membership list of the Academy. A red cloth cover was used to indicate the inclusion of the cumulative index, compiled by R. C. Friesner, which covered volumes 51-60.

Press Secretary. Ben Moulton wishes to thank Mr. Mel Doering of the Public Relations Office of Valparaiso University and Mr. John Barnett and Mr. Jack Shackelford of Butler University for their help and kindness in preparing and distributing the press releases. Press releases were made through the usual channels including radio and television.

Program. Dr. A. H. Meyer reported completed arrangements for the Fall Meeting. The attendance at the Spring Meeting was good and the number of papers to be given at the Fall Meeting compares very favorably with the past years.

Biological Survey. In the absence of Chairman Dr. C. B. Heiser, Jr., Dr. Edwards read portions of a letter from the chairman outlining possible future aims of the committee. No committee report was given.

Index. Dr. Ray C. Friesner reported as follows: "The cumulative index for volumes 51-60 of the Proceedings has been published as pages 357-455 of volume 61. Publication of this index has been made possible by funds from the Lilly Foundation. Indexing of volume 61, toward a cumulative index for volumes 61-70, is under way."

Indiana Science Talent Search. Chairman R. W. Lefler reported the following: College recognition of winners and participants in the Indiana Science Talent Search continues strong. Fifty-seven of the sixty-one participants of last year are in college. Forty-three have received scholarships ranging from Honorary to stipends covering full subsistence. No Indiana high school senior with real potential in science or engineering need be deprived of a college education because of financial conditions, if he will but prove his metal in the Science Talent Search, and maintain adequate scholastic standing once he is admitted to undergraduate study. The Indianapolis Times continues to provide the financial support which makes this activity of the Junior and Senior Academy possible. It was suggested that the secretary write a letter to Walter Leckrone, editor of the Indianapolis Times, thanking him for his continued loyal support of the Junior Academy.

Junior Academy. Dr. Michaud stated that there are at present thirty-eight clubs in the Junior Academy. The response to participation in this year's program has been unusually good. The Junior Academy has continued its affiliation with Science Clubs of America and cooperated in the 1952 state and national Science Talent Search. (Sixty-one students finished the requirements for the Science Talent Search and were invited to participate in the fifth annual Junior Scientists Assembly at the Claypool Hotel in Indianapolis last March.) The Indianapolis Times and the State Science Talent Search Committee, under the direction of Prof. R. W. Lefler, Purdue University, are to be highly commended for the splendid work being done in the identification of science talented youth.

Library. Miss Nellie Coats reported that from its expanding list of exchange agencies, the library is receiving forty new serial titles and has been able to fill in certain files by gifts from others, notably the Annals of the Museum of the Belgian Congo. Among new titles: Blyttia, published by the Norsk Botanisk Forening; Technical papers of the Australian Scientific and Industrial Research Organization, Division of Fisheries; the Boletim paulista de geografia; Memorias, Sociedade broteriana, Coimbra, Portugal; Pratika, Hellenikon hydrobiologikon institut; Annals, Ukrainian Academy of Arts and Sciences, and several titles from the Slovene Academy of Sciences and Arts, Ljubljana.

Early volumes of the Philippine journal of science were obtained at a cost of \$45.

A sum of \$500 had been allotted for binding. One hundred sixty-three volumes were bound at a cost of \$500.99.

The Library will very shortly mail copies of volume 61 to agencies on its exchange list. Members' copies were mailed by the Bookwalter printing establishment.

Representing the State Library and the Academy Library, your committee chairman attended the Special Libraries Association meeting in New York City last May.

Checking was completed of titles to be recorded in the Union List of Serials supplement to be issued by the H. W. Wilson Company.

Copies of the Index, volumes 1-50, and of Visher, Indiana Scientists are still available.

Membership. Dr. R. E. Girton reported that 47 applications for membership had been received to date. This makes a total of 62 to date for 1952.

Representative on Council of the A.A.A.S. Dr. W. H. Johnson stated that he attended the meetings held in Philadelphia on December 27 and 29, 1951. Nothing of immediate importance was noted insofar as our Academy was concerned.

Relation of Academy to State. Chairman Frank N. Wallace reported that the Academy should request \$3,500 from the state to publish Vol. 62 of the Proceedings.

Nomination Committee. Chairman Paul Weatherwax recommended that Dr. R. N. Harger succeed himself as Chairman of the Academy Foundation Committee.

Dr. Ray C. Friesner, Chairman, and Scott McCoy continue on the Bonding of Trustees Committee.

Dr. W. H. Johnson to continue serving on the Research Grants Committee.

The following were recommended for the rank of fellow:

Charles L. Bieber, Geology, DePauw University
W. R. Breneman, Zoology, Indiana University
S. E. Elliott, Physics, Butler University
Geo. E. Gould, Entomology, Purdue University
H. H. Remmers, Psychology, Purdue University
Robt. R. Shrock, Geology, M. I. T.
Alvin Strickler, Chemistry, Evansville College
T. W. Torrey, Zoology, Indiana University

Old Business.

Constitution Revision Committee. Chairman W. A. Daily read the following proposed amendments to the constitution: Article II, Section 1. Members of this Academy shall be Annual members, Life members, Emeritus members and Fellows. Article II, Section 3. Members who are actually engaged in scientific work, who have recognized standing in their respective fields and who have been members of the Academy at least three years, may be recommended for nomination for election as Fellows by the Fellows Committee.

Nominations for Fellows shall be made to the chairman of the Fellows Committee previous to the annual meeting of the Executive Committee. The Fellows Committee shall submit its recommendations to the Executive Committee, which shall then pass its nominations on to the general session of the Academy for vote. A three-fourths vote of the members present shall elect. By-laws, Article II, Section (m). Fellows. The committee on Fellows shall be composed of one Fellow to be appointed by the President from each section of the Academy. The membership shall rotate alphabetically by section. Members from two sections shall be replaced each year except every fifth year when three members shall be replaced. Members of the initial committee shall serve one to five years depending upon the system of rotation. All appointments thereafter shall be for five

years. A chairman shall be appointed annually by the President from the members of the committee for one year only.

These were so moved and approved.

John S. Wright Memorial Committee. Chairman W. E. Edington reported as follows: The Academy Library located in the State Library in Indianapolis be hereafter designated and referred to as the John Shepard Wright Memorial Library of the Indiana Academy of Science, and that a bronze plaque so inscribed be placed at a suitable point in the State Library. This was approved.

New Business.

1. Dr. R. W. Lefler presented the following resolution which was approved:

Be it resolved that the Indiana Academy of Science will support the movement of Science Fairs in the state of Indiana so as to bring about a better understanding of scientific endeavor on the part of the students and the teachers in the secondary schools and to make it possible to understand scientific experimentation and its application to the problems of modern living.

The Academy also welcomes the participation of the local talent in the National Science Fair and will support the movement so as to make it possible that this participation will be commensurable with the scientific effort of the State of Indiana.

2. A joint Spring Meeting of the Kentucky and Indiana Academies of Science was considered. Incoming officers and the Chairman of the Program Committee will consider such a move.

3. It was suggested and approved that Dr. Ray C. Friesner send a telegraph message to Dr. and Mrs. Charles C. Deam, who could not attend the Fall Meeting.

The meeting adjourned at 10:10 P. M. Refreshments were served during a reception for Academy members and guests in the Auditorium of Kroencke Hall.

MINUTES OF THE GENERAL SESSION

VALPARAISO UNIVERSITY, OCT. 17, 1952

Dean Walter E. Bauer of Valparaiso University welcomed the Academy to their campus. A response was given by President P. D. Edwards.

The minutes of the Executive Committee were read, corrected and approved.

W. E. Edington presented a short biography of the members who had died during the year. These were F. E. Bibbins, Charles Hire, E. G. Mahin, A. P. Poorman, H. W. Rhodehamel, E. R. Smith and J. E. Switzer.

Mr. Walter Blucher, Executive Director, American Institute of Planning Officials gave a very interesting talk on "Planning as a Science."

Dr. Harry G. Day, Chairman, Chemistry Department, Indiana University, talked on the subject, "Perspectives in the Science of Nutrition."

The meeting adjourned at 10:30 A. M. to meet in the various sections. Luncheon was served in the University Cafeteria at 12:00 noon.

The annual dinner was held in the University Gymnasium. The Valparaiso University Orchestra and Choir presented several selections.

Dr. H. M. Powell, Vice-President of the Academy, introduced the 1952 officers. Dean W. E. Bauer, in the absence of President O. P. Kretzmann, presented greetings to the Academy members and guests.

Dr. P. D. Edwards then gave a scholarly presidential address on the subject, "The Role of Mathematics in Science." During the following short business session, Dr. R. E. Girton presented 59 applications for membership. The President instructed the Secretary to cast a unanimous ballot in favor of the applicants.

Dr. R. L. Shelley presented the following resolutions:

Resolved:

That this assembly wishes to thank Valparaiso University, its President, Dr. O. P. Kretzmann, Dean Walter E. Bauer and other officials for the fine manner in which they have entertained the Academy; for making its facilities available, doubtless at some cost to its student body; for the excellent food served us during our visit on their campus; for the science students who served to keep us well informed as to the progress of the individual sections; and otherwise to help and guide us about their campus; for Dr. A. H. Meyer and the able members of his Program Committee for the efficient manner in which they made and carried out the arrangements for this smooth running program. Recognizing the value of the efforts of all these workers in Valparaiso University to this Academy we hereby commend them for their efforts.

Resolved:

That the officers of this Academy have carried on our affairs during the past year with consummate skill and effectiveness and are due our deep appreciation. Our thanks also to the men of science who worked diligently as Divisional Chairmen, developing outstanding programs in

each of the 12 sections. Our thanks also to all those who presented papers without whose endeavors this meeting could not have been successful.

In the absence of John S. Karling, President Edwards reported that the Invitations Committee had accepted the offer to hold the 1953 Fall Meeting on the Earlham College campus.

Editor A. A. Lindsey announced the selection by the Awards Committee of the following papers for prizes:

The David Starr Jordan Prize in Zoology is awarded to Dr. Theodore W. Torrey for his paper, "Balanoglossus and the Origin of the Vertebrate Nephros." The William A. Noyes Prize in Chemistry is awarded to Dr. Milton Burton for his paper "Some Elementary Physical and Chemical Processes in Radiobiology."

The Nominations Committee report was given by the Chairman, Dr. Paul Weatherwax. Divisional Chairmen for 1953 will be: 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; Physics, R. E. Winn, Indiana State Teachers College; Psychology, (to be announced); Zoology, W. H. Johnson, Wabash College.

The following persons were recommended to serve as the 1952 officers: President, H. W. Powell, Eli Lilly and Company; Vice-President, A. H. Meyer, Valparaiso University; Secretary, W. A. Daily, Eli Lilly and Company; Treasurer, Frank Welcher, Indiana University Adult Education Center, Indianapolis; Editor, Ben Moulton, Butler University; Press Secretary, J. A. Clark, Department of Conservation, Indianapolis.

The sixty-eighth annual meeting of the Indiana Academy of Science with a general attendance of 395 and a dinner attendance of 125, was adjourned.

W. A. DAILY, Secretary

CONSTITUTION OF THE INDIANA ACADEMY OF SCIENCE¹

ARTICLE I.

Section 1. This Association shall be called the Indiana Academy of Science.

Sec. 2. The objects of this Academy shall be scientific research and the diffusion of knowledge concerning the various departments of science. The Academy shall promote intercourse between men engaged in scientific work, especially in Indiana, assist by investigation and discussion in developing and making known the educational, material and other resources and riches of the state, prepare for publication such reports of investigation and discussion as may further the aims and objects of the Academy as set forth in these articles.

Since the state has agreed to make an annual appropriation to assist the publication of such proceedings, the Academy shall upon the request of the governor, or one of the several departments of the state, through the governor, act through its Executive Committee, or Subsidiary Committee as an advisory body in the direction and execution of any investigation within its province as stated. The necessary expenses incurred in the prosecution of such investigation are to be borne by the state; no pecuniary gain is to come to the Academy for its advice or direction of such investigation.

The regular proceedings of the Academy, in so far as published by the state, shall become a public document and be circulated by the Indiana State Library as agreed upon by the Library and the Academy Committee on Relation of the Academy to the State.

ARTICLE II.

Section 1. Members of this Academy shall be Annual members, Life members, Emeritus members and Fellows.

Sec. 2. Any person interested in any department of scientific work shall be eligible to membership. Annual members may be elected at any meeting of the Academy. New members shall pay an initiation fee of one dollar and the annual dues for one year. Any person who shall contribute twenty-five times the annual dues to the funds of this Academy may be elected a Life member of the Academy, free of assessment. Applications for membership shall be referred to a Membership Committee which shall report to the Academy before the election.

Sec. 3. Members who are actually engaged in scientific work, who have recognized standing in their respective fields and who have been members of the Academy at least three years, may be recommended for nomination for election as Fellows by the Fellows Committee.

Nominations for Fellows shall be made to the chairman of the Fellows Committee previous to the annual meeting of the Executive Committee.

¹ As revised, October 17, 1952.

The Fellows Committee shall submit its recommendations to the Executive Committee, which shall then pass its nominations on to the general session of the Academy for vote. A three-fourths vote of the members present shall elect.

Sec. 4. The Indiana Academy of Science shall actively promote the organization and operation of local science clubs in connection with secondary schools of the state. Such of these clubs as elect to become members shall constitute the Indiana Junior Academy of Science.

The President shall appoint annually a committee of five members from the Indiana Academy of Science to have full charge, within the Academy, of the Junior Academy of Science. It shall formulate the requirements for membership of local science clubs, and election of such clubs must be approved by the Executive Committee of the Academy.

Each applicant club, upon meeting Academy affiliation requirements, payment of an entry fee of \$1.00 and an affiliation fee equal to the annual dues of annual members, and upon recommendation of the committee in charge, shall receive for its files a certification of membership signed by the President, Secretary, and Treasurer of the Academy. Such affiliation shall continue upon payment of annual affiliation fee so long as the club continues to meet requirements of membership. Each affiliated club will receive one copy of the Proceedings of the Indiana Academy of Science.

The Committee, in council with the President, Secretary and Treasurer, shall formulate a program of work. An annual report of the progress made shall be presented to the Executive Committee of the Indiana Academy of Science by the chairman of the Academy Committee on Junior Academy of Science.

Sec. 5. Any member of the Academy because of age or condition of health may, upon recommendation of the Secretary and approval of the Executive Committee by a three-fourths vote of the members present, become an Emeritus member. Emeritus members shall pay no further dues but shall be entitled to all privileges of Academy membership except receipt of the Proceedings, unless by special act of the Executive Committee, in recognition of outstanding services to the Academy, the Proceedings shall be ordered continued to such Emeritus members.

ARTICLE III.

Section 1. The officers of the Academy shall be elected at the annual meeting and shall hold office for the calendar year following their election. They shall consist of a President, Vice-President, Divisional Chairmen, Secretary, Press Secretary, Editor, and Treasurer, who shall perform the duties usually pertaining to their respective offices and in addition, with the ex-presidents of the Academy and chairmen of all standing committees, shall constitute the Executive Committee. The Divisional Chairmen shall be chosen by ballot by their respective sections during the annual meeting. Each Divisional Chairman shall have the power to appoint an Assistant Chairman to assist him in the sectional duties. No section shall have representation on the Executive Committee without the sanction of the Executive Committee.

Sec. 2. The annual meeting of the Academy shall be held at a time and place designated each year by the Executive Committee. There shall

also be a spring or summer field meeting at such time and place as may be decided upon by the Executive Committee or Subsidiary Committee. Other meetings shall be called at the discretion of the Executive Committee. The officers of the Academy shall constitute the Council of the Academy and represent it in the transaction of any necessary business not especially provided for in this constitution, in the interim between general meetings.

Sec. 3. This constitution may be altered or amended at any annual meeting by a three-fourths majority of the attending members of at least one year's standing. No question of amendment shall be decided on the day of its presentation.

BY-LAWS

ARTICLE I.

Section 1. President: The President shall preside over all meetings of the Academy, of the Executive Committee, and of the Council. He shall be responsible for the administration of all laws and regulations of the Academy and of its committees. He shall call special meetings of the Academy, of the Executive Committee or of the Council whenever he shall consider such meetings necessary, or upon the request of the Executive Committee. He shall appoint all standing committees.

Sec. 2. Vice-President: In the absence of the President, the Vice-President shall preside over all meetings as specified in Section 1 of this article, and he shall assume the powers and prerogatives of the President, in so far as the circumstances shall warrant.

Sec. 3. Divisional Chairmen: The Divisional Chairmen shall preside over the meetings of their sections. They may each appoint an assistant chairman to assist in the work of the section and to preside in their absence.

Sec. 4. Secretary: The Secretary of the Academy shall be secretary also of the Executive Committee and of the Council. He shall keep a permanent record of all proceedings of these bodies, including all resolutions and formal actions. He shall issue, or cause to be issued, all notices of meetings. He shall maintain a register of the members of the Academy.

Sec. 5. Press Secretary: It shall be the duty of the Press Secretary to furnish the press with notices of meetings of the Academy and with such other material as may be suitable for purposes of publicity, to the general end that the public may be acquainted with the purposes and with the work of the Academy.

Sec. 6. Editor: The Editor, with the assistance of such members or committees as shall be designated by the Academy for the purpose, shall have charge of the publication and distribution of the Proceedings of the Academy, and any other special publications, not directly entrusted to other officers, individuals, or committees. He shall prepare and submit to the Executive Committee reports covering his receipts and expenditures in connection with these duties.

Sec. 7. Treasurer: The Treasurer shall have the custody of all funds of the Academy, except such as shall have been, by specific action of the Academy, entrusted to other officers or committees. He shall issue bills

for dues and assessments payable and he shall make proper receipt for the same. All bills properly chargeable to the Academy shall be paid by check of the Treasurer, but only after approval by the President and the Secretary of the Academy. He shall prepare complete reports of Academy finances for submission at the annual meeting, and at such other times as may be directed by the Academy or by the Executive Committee.

ARTICLE II.

Section 1. Standing Committees: The following standing committees shall be appointed by the President of the Academy, to serve for one year unless reappointed or stated otherwise:

(a) The Academy Representative on the Council of the American Association for the Advancement of Science shall represent the Academy in all matters coming before that Council.

(b) Archeological Survey. This committee shall have charge of all matters of archeological and historical nature.

(c) Auditing. This committee shall audit the books of the Treasurer, and of such other officers or committees as shall have been given custody of the funds of the Academy. It shall report the results of such audit at the annual meeting of the Academy.

(d) Biological. This committee shall have charge of all matters pertaining to the distribution of the fauna and flora of the state.

(e) Junior Academy of Science. This committee shall have charge of all matters pertaining to the relations between the Academy and the chapters of the Junior Academy of Science.

(f) Library. This committee shall have charge of all matters pertaining to the library of the Academy and its relation to the State Library.

(g) Membership. This committee shall receive applications for membership in the Academy and it shall submit reports and recommendations covering such applications, at any regular meeting of the Academy.

(h) Nominations. This committee shall consider and report to the annual meeting, nominations for President, Vice-President, Secretary, Press Secretary, Treasurer and Editor. Nominations may be supplemented by nominations from the floor.

(i) Program. The Program Committee shall make all arrangements for the regular or special meetings of the Academy.

(j) Publication of Proceedings. This committee shall assist the Editor in matters pertaining to publication and distribution of the Proceedings.

(k) Relation of Academy to State. This committee shall have charge of all relations between the Academy and the state government.

(l) Research. This committee shall consider and report to the Academy concerning all policies that are proposed for the encouragement and promotion of scientific research within the state.

(m) Fellows. The committee on Fellows shall be composed of one Fellow to be appointed by the President from each section of the Academy. The membership shall rotate alphabetically by section. Members from two sections shall be replaced each year except every fifth year when three members shall be replaced. Members of the initial committee shall serve one to five years depending upon the system of rotation. All appointments

thereafter shall be for five years. A chairman shall be appointed annually by the President from the members of the committee for one year only.

Sec. 2. Announcement of Committee Membership: The membership of all standing committees shall be announced by the President within a reasonable time after their appointment and such membership shall be published in the Proceedings of the Academy: *Provided, however,* That at his discretion the President may withhold the announcement of the membership of the Committee on Nominations until this committee is ready to report at the annual meeting.

Sec. 3. The President shall be, ex officio, a member of all standing committees.

Sec. 4. All committees shall be subject to the call of their respective chairmen.

Sec. 5. Special Committees: Special committees may be appointed by the President, or in any other manner that may be specified by the Academy or by the Executive Committee.

ARTICLE III.

Section 1. These by-laws may be amended at any regular or special meeting of the Academy.

ARTICLE IV.

Section 1. Twenty-five or more members of the Academy shall constitute a quorum for the transaction of business.

Sec. 2. One-fourth or more of the members of the Executive Committee or of the Council shall constitute a quorum respectively for these two bodies.

ARTICLE V.

Section 1. Members whose dues remain unpaid for two years, having been annually notified of their arrearages by the Treasurer, shall have their names stricken from the roll.

Sec. 2. The annual dues shall be determined by the Executive Committee.

ARTICLE VI.

Section 1. The rules of procedure prescribed by Roberts' Rules of Order shall govern all business meetings of the Academy and of the Executive Committee.

EDITORIAL POLICY

PART I.

Since the Proceedings is the annual exhibit of the Indiana Academy of Science, members should not jeopardize their reputation or that of the Academy by submitting and anticipating publication of inferior papers. On the other hand, the Academy, with an aim to encourage and assist younger scientists, should be lenient and assist the inexperienced workers as long as the content of papers is reliable and worthy and a contribution to knowledge. The experienced workers should feel a responsibility for all papers from the younger men. The opportunity presented by the

Academy as an outlet for research in a small way constitutes a service to science and to the state.

The Editorial Board or Committee should consist of the Editor as chairman and two other members, at least one of whom should be a past editor. This board or committee may designate one member in each major science of the Academy to judge and edit papers in their field. The Editor may request the opinion of out-of-state scientists but the Editorial Board has final authority. It is suggested that the Editor and Editorial Board formulate a revised Editorial Code for the guidance of writers.

PART II.

In selecting papers for publication in the Proceedings of the Indiana Academy of Science the following principles shall act as a guide for the Editor and/or Editorial Committee.

1. Papers by resident members of the Academy will be given preference, other things being equal, and the Editor or Editorial Committee shall refuse papers by non-members, and members who are in arrears.

2. Papers on the printed program will have publication priority, if they meet other publication requirements.

3. Papers relating to Indiana flora, fauna, ecology, geography and geology will have preference over similar papers dealing with flora, fauna, etc., of regions outside Indiana.

4. Papers submitted for publication should be only those which have not been published elsewhere or will not be submitted for publication elsewhere.

5. Other things being equal, only one paper by the same author may be accepted by the Editor if funds do not permit the publication of all suitable papers submitted for publication. Authors submitting more than one paper should indicate the paper to be given preference.

6. The Editor and Editorial Committee shall have the privilege of using referees wherever they deem it advisable, the action of the Editorial Committee to be final.

7. Each paper should be a contribution to knowledge. Briefness and clarity should be the rule in writing.

8. Illustrations and tables should be used only when necessary and/or when they add materially to the paper.

9. Other things being equal, papers should be selected on the basis of merit.

NEW MEMBERS 1952¹

Angrick, Warren Lewis, 5141 N. Illinois St., Indianapolis, Ind.	Bo, Z
Barrett, John P., Armour & Co., Research Div., Union Stock Yards, Chicago 9, Ill.	E
Beckett, K. Eileen, 508 N. Lebanon St., Lebanon, Ind.	Bo
Blair, Walter Beale, Dept. of Geography, Butler Univ., Indianapolis 7, Ind.	G
Bracken, Lawson E., 730 E. Washington St., Indianapolis, Ind.	G
Brake, Earl F., Butler Univ. Col. of Pharmacy, Indianapolis 7, Ind.	C
Brunson, Ruth, 6307 N. Navajo Ave., Chicago 30, Ill.	Bo
Burdick, Dr. Allan B., Dept. of Biological Sciences, Purdue Univ., Lafayette, Ind.	Bo
Carter, Gordon, R. R. 1, Gaston, Ind.	Bo
Cassady, Donald R., 6916 Park Ave., Indianapolis, Ind.	C
Christens, John M., Dept. of Chemistry, Indiana Univ., Bloomington, Ind.	C
Clark, Dr. William C., Dept. of Biochemistry and Pharmacology, Indiana Univ. School of Medicine, Indianapolis 7, Ind.	Z
Coleman, Robert M., Box 126, Dept. of Biology, Univ. of Notre Dame, Notre Dame, Ind.	Z
Crowder, Dr. Harold W., 4026 Avondale, Fort Wayne, Ind.	Z
Dale, Mrs. Catherine W., 222 N. Harvey Ave., Griffith, Ind.	Bo
Davis, Jeanette M., 3204 E. 39th St., No. 551, Indianapolis, Ind.	Ba
Davis, Dr. Ralph L., No. 3 David Ross Rd., W. Lafayette, Ind.	Bo
De Vol, Prof. Lentz C., Valparaiso Univ., Valparaiso, Ind.	Ph
Dewar, Norman E., 330 W. Fowler St., W. Lafayette, Ind.	Ba
Dufford, Prof. R. T., Dept. of Physics, Evansville Col., Evansville, Ind.	Ph
Downie, Dr. N. M., 1621 Purdue Street, Lafayette, Ind.	Ps
Farquharson, Lois, Dept. of Botany, Indiana Univ., Bloomington, Ind.	Bo
Fisher, Dr. Dale J., Oak Ridge National Lab., P. O. Box P, Oak Ridge, Tenn.	C
Fisher, T. Richard, Dept. of Botany, Indiana Univ., Bloomington, Ind.	Bo
Ford, Dr. Lee, Anderson Col., Anderson, Ind.	Bo
Gebhard, Dr. Paul H., Wiley Hall, Ind. University, Bloomington, Ind.	A
Graebner, Dr. Oliver E., Valparaiso Univ., Valparaiso, Ind.	Ps
Gruha, Ed. A., FPHA 333-1, W. Lafayette, Ind.	Ba
Hamilton, Donald W., U. S. Bur. Ent. & Pl. Quar., 1237 Wash. Ave., Vincennes, Ind.	Ent
Harned, Dr. B. K., Mead-Johnson Research Labs., Evansville 21, Ind.	C
Hart, John Robert, R. R. 1, Princeton, Ind.	Bo
Hudson, John T., City Schools, Falls City, Nebr.	G
Hueber, Francis M., 1603 Central Ave., Apt. 115, Indianapolis 4, Ind.	G
Hull, Dr. Robert N., 2301 Elizabeth St., Indianapolis, Ind.	Ba, Bo, Z
Humphrey, William F., 202 E. 33rd St., Indianapolis 5, Ind.	Bo

¹ Abbreviations following the members' listings indicate the section of the Academy with which they are affiliated. In addition to the usual abbreviations is E, Entomology.

Jackson, Raymond C., 612 S. Fess Ave., Bloomington, Ind.	Bo
Kavanagh, Dr. Virgene, V. Kavanagh Lab., 812 South 25th St., Terre Haute, Ind.	Z, Ba
Kline, Doris Ruth, Rogers Center, Box 71, Bloomington, Ind.	Z
Knight, Percy Leonard, 1626 N. Ironwood Dr., South Bend, Ind.	Z
Koenig, Harold P., Valparaiso Univ., Valparaiso, Ind.	C
Lawrence, John L., Wabash Col., Crawfordsville, Ind.	M
Le Zotte, Lloyd A., Jr., Dept. of Biological Sciences, Purdue Univ., Lafayette, Ind.	Z
Ling, Dr. Rufus C., 898 E. Jefferson St., Franklin, Ind.	Ph
Lipscomb, Robert G., 702 Bacon, Indianapolis, Ind.	Bo
Lockard, Dan H., J. I. Holcomb Research Labs., 4401 Cold Spring Rd., Indianapolis, Ind.	E
Lyman, Sally Jane, 5947 Crest View Dr., Indianapolis 20, Ind.	Bo
McCormick, Louise, 925 N. Hawthorne Lane, Indianapolis 19, Ind.	Bo, H
Macklin, Jerry M., 108 Waldron, W. Lafayette, Ind.	E
Maxwell, Thomas J., 1504 Main Ave., West, Massillon, Ohio	A
Meibohm, Dr. Alvin W., Valparaiso, Univ., Valparaiso, Ind.	C
Mitchell, Max L., 1330 W. Michigan St., Rm. 377, Indianapolis, Ind.	G, H
Monaco, Lawrence H., Box 126, Notre Dame Univ., Notre Dame, Ind.	Z
Muller, Dr. Joseph Charles, Dept. of Chemistry, Indiana Univ., Bloomington, Ind.	C
Newhouse, Florence M., 5864 Lowell Ave., Indianapolis, Ind.	Bo
Nielson, Blanche S., 1015 Crescent Ave., Fort Wayne 3, Ind.	G
Peckham, Richard S., Box 126, Dept. of Biology, Notre Dame Univ., Notre Dame, Ind.	Z
Phillips, Ralph W., 1121 W. Michigan St., Indianapolis, Ind.	C
Pounds, Norman J. G., Dept. of Geography, Indiana Univ., Bloomington, Ind.	G, H
Reed, Helen E., Apt. 1, 423 N. Lebanon St., Lebanon, Ind.	Bo, Z
Riedhart, Joseph M., Dept. of Biological Sciences, Purdue Univ., Lafayette, Ind.	Bo
Robinette, Chester W., 1111 Union St., Lafayette, Ind.	E
Romberg, Paul F., Wabash Col., Crawfordsville, Ind.	Bo
Rosauer, Elmer A., 116 Marstellar St., W. Lafayette, Ind.	G
Rothwell, Norman V., Dept. of Botany, Indiana Univ., Bloomington, Ind.	Bo
Shaver, Robert J., Box 126, Dept. of Biology, Notre Dame Univ., Notre Dame, Ind.	Z
Siebe, Mrs. Grace D., Dept. of Microbiology, Indiana Univ. Medical Center, 1040-1232 W. Michigan St., Indianapolis 7, Ind.	Ba
Smith, Lewis O., Jr., Valparaiso Univ., Valparaiso, Ind.	C
Stanley, Dr. Paul E., School of Aeronautics, Purdue Univ., Lafayette, Ind.	Ph
Stantz, Guy, Principal, Gerstmeier Tech. H. S., Terre Haute, Ind.	A, Bo, G
Starcs, Karlis, 5870 Sunset Lane, Indianapolis 20, Ind.	Bo
Stewart, Lola, 341 McKinley St., Gary, Ind.	Bo, Z
Stoutamire, Warren P., Dept. of Botany, Indiana Univ., Bloomington, Ind.	Bo

Taylor, James Woodall, Dept. of Geography, Indiana Univ., Bloomington, Ind.	G
Thompson, Dr. Randall L., Indiana Univ. Medical Center, Indianapolis 7, Ind.	Ba
Throw, Prof. Francis E., Wabash Col., Crawfordsville, Ind.	Ph
Townsend, Earl C., Jr., 23 Kenmore Rd., Indianapolis, Ind.	A
Van Derbilt, Betty, 5131 Central Ave., Indianapolis, Ind.	G
Wallace, Edith, 617 Buchanan St., Gary, Ind.	Bo, Z
Weaver, Dr. R. H., Dept. of Bact., U. of Kentucky, Lexington, Ky.	Ba
Wolfe, Ruby, 3267 College Ave., Indianapolis, Ind.	Bo, Z
Wood, Raymond A., Box 126, Dept. of Biology, Univ. of Notre Dame, Notre Dame, Ind.	Z
Young, Robert N., Dept. of Geography, Indiana Univ., Bloomington, Ind.	G

JUNIOR ACADEMIES

- Science Club, Calumet High School, 5815 W. Ridge Rd., Gary, Ind.
 Biology Club of Tolleston School, 1700 Taney, Gary, Ind.
 Science Club of Hobart, Ind., Hobart High School, Hobart, Ind.
 Junior Izaak Walton League of John Adams High School, Cor. of Twyck-
 enham and Mishawaka Ave., South Bend, Ind.



INDIANA JUNIOR ACADEMY OF SCIENCE OFFICERS FOR 1952

David Brenner, New Castle, Indiana, President.

Nancy Miller, Elkhart, Indiana, Secretary.

INDIANA JUNIOR ACADEMY OF SCIENCE

Officers for 1952:

President: David Brenner, Science Club, New Castle High School, New Castle.

Vice-President: Joyce Baldwin, Phy-Chem Club, Elmhurst High School, Fort Wayne.

Secretary: Nancy Miller, Junior Academy, Elkhart High School, Elkhart.

Press Secretary: David Taylor, Science Club, Thomas Carr Howe High School, Indianapolis.

Members of the Council: Evelyn Wagoner, Elkhart, (1948-1952); Max Forsyth, Indianapolis, (1949-1953); Harold Stewart, Bloomington, (1949-1954); Arthur L. Smith, South Bend, (1950-1955); Charles E. Karst, Mishawaka, (1952-1956).

PROGRAM OF THE TWENTIETH ANNUAL MEETING

October 18, 1952

University Auditorium

Valparaiso University, Valparaiso, Indiana

8:00-10:00 a.m. Exhibits, Science Building, Room 2.

10:00 a.m. Morning Session, University Auditorium.

General Session, David Brenner, presiding.

Reading of the minutes of the 1951 meeting, Nancy Miller, Secretary.

Greetings, Dr. Walter E. Bauer, Dean of the Faculty, Valparaiso

University.

1. Herpetology as a Hobby. Helen Emmons and Don Lambdin, Junior Academy of Science, Elkhart High School, Elkhart.

2. Nuclear Energy in the Sun. (Chart talk.) David Nowicki, Central Junior Academy, Central High School, South Bend.

3. Ways of Living in Mexico. (Illustrated.) Mina Zaldivar, Biology Club, Lew Wallace High School, Gary.

4. Distillation of Crude Oil. Mike Deitch, Senior Science Club, State High School, Terre Haute.

5. How I Became Interested in Insects. Robert MacFarland, Biology Club, Tolleston High School, Gary.

6. Chemistry of Coal. Jim Griffiths, Senior Science Club, State High School, Terre Haute.

7. A Study of the Reptiles of St. Joseph County. (Illustrated.) Warren Schackenman, Central Junior Academy, Central High School, South Bend.

8. The Fluorescence of Minerals. Joe Mosier, National Scientific Honor Society, Bloomington High School, Bloomington.

12:00 Noon Luncheon.

1:30 p.m. Afternoon Session, University Auditorium.

Business Session.

9. Steps for Beginners in Bacteriology: Special Work in Immunology. John Costas, National Scientific Honor Society, Bloomington High School, Bloomington.

10. Meteorology and Weather. (Illustrated.) Richard Stevens, Science Club, Mishawaka High School, Mishawaka.

11. The Mighty Atom. Ruth McKnight, National Scientific Honor Society, Bloomington High School, Bloomington.

12. Effect of Vitamin A Deficiency in Hamsters. Sybil Johnson, Science Club, University High School, Bloomington.

MINUTES

The twentieth annual meeting of the Indiana Junior Academy of Science was held Saturday, October 18, 1952 in the University Auditorium of Valparaiso University, Valparaiso, Indiana.

The exhibit room opened at 8:00 a.m. in Room 2 of the Science building. Many interesting scientific projects and demonstrations were displayed by the club members.

The general session was called to order at 10:15 a.m. by President David Brenner, Science Club, New Castle High School, New Castle. The president introduced the state secretary, Nancy Miller, Junior Academy, Elkhart High School, Elkhart. The other state officers, Vice-President Joyce Baldwin, Phy-Chem Club, Elmhurst High School, Fort Wayne, and Press Secretary David Taylor, Science Club, Howe High School, Indianapolis, were unable to attend the meeting.

The minutes of the 1951 meeting were read by the secretary. Dr. Walter E. Bauer, Dean of the Faculty, Valparaiso University, welcomed guests and members of the Junior Academy. He spoke briefly on the progress in science and encouraged the young high school people to continue their interest in science.

Helen Emmons and Don Lambdin, Junior Academy, Elkhart High School, Elkhart, opened the morning program of student papers with a talk on "Herpetology as a Hobby." They discussed the various reptiles and showed a part of their collection of living animals to the audience.

"Nuclear Energy in the Sun," was the topic presented by David Nowicki, Central Junior Academy, Central High School, South Bend.

Mina Zaldivar, Biology Club, Lew Wallace High School, Gary, spoke on "Ways of Living in Mexico." Having lived in Mexico until recently, Mina gave a very interesting account of her experiences there. Her talk was illustrated with recent scenes of Mexico.

A talk on "Distillation of Crude Oil" was given by Mike Deitch, Senior Science Club, State High School, Terre Haute. The apparatus used in the distillation process was on display in the exhibit room in the science building.

Next, Robert MacFarland, Biology Club, Tolleston High School, Gary, discussed how he became interested in insects. He had his collection on display.

"Chemistry of Coal" was the topic presented by Jim Griffiths, Senior Science Club, State High School, Terre Haute.

Warren Schackenman, Central Junior Academy, Central High School, South Bend, discussed the subject "A Study of the Reptiles of St. Joseph County." The kodachrome slides that Warren used to illustrate his talk added considerable interest to the subject.

The last talk of the morning session was given by Joe Mosier, National Scientific Honor Society, Bloomington High School, Bloomington. In discussing "The Fluorescence of Minerals," he showed the different reaction of various minerals to fluorescent light.

The morning session was adjourned at 12:00 noon.

Luncheon was served in the University cafeteria. After lunch, students and guests explored the University campus and visited the exhibit room.

The afternoon session was called to order by David Brenner at 1:30 p.m. The first item of the business meeting was the election of new officers. A partial slate of officer candidates was submitted by the council and additional nominations were accepted from the floor. The following officers were elected for 1953: President, David Stevenson, Phy-Chem Club, Elmhurst High School, Fort Wayne; Vice-President, Don Lambdin, Junior Academy, Elkhart High School, Elkhart; Secretary, Mina Zaldivar,

Biology Club, Lew Wallace High School, Gary; Press Secretary, Gail Diamondis, Junior Academy, Central High School, South Bend.

The first speaker of the afternoon session was Richard Stevens, Science Club, Mishawaka High School, Mishawaka, who presented an illustrated talk on "Meteorology and Weather."

Sybil Johnson, Science Club, University High School, Bloomington, spoke on "The Effect of Vitamin A Deficiency on Hamsters." Her talk attracted considerable attention because of the caged hamsters that were brought along as a part of the demonstration.

Ruth McKnight, National Scientific Honor Society, Bloomington High School, Bloomington, concluded the program of papers with a talk on "The Mighty Atom."

The president announced that Miss Edith Wallace, Sponsor, Biology Club, Tolleston High School, Gary, was elected new council member to succeed Miss Evelyn Wagoner of Elkhart whose term expired in 1952.

Professor Howard H. Michaud, Department of Forestry, Purdue University, and State Sponsor of the Junior Academy, reported on the progress of clubs during the past year. Professor Michaud called the roll of clubs and asked each to stand. Special mention was made of the new clubs for 1952 which included the following: Biology Club, Tolleston High School, Gary, Edith Wallace, Sponsor; Science Club, Hobart High School, Hobart, Lola Stewart, Sponsor; Science Club, Calumet Township High School, Gary, Mrs. Catherine Dale, Sponsor; Junior Walton League, John Adams High School, South Bend, Ernest Litweiler, Sponsor.

Professor Michaud announced that David Nowicki, Junior Academy, Central High School, South Bend, had been chosen to receive the annual title of "best boy." There were no candidates for the "best girl" award. The annual selections are made by the council. The choice of winners is based upon information on each student submitted by sponsors of science clubs. Recipients of this honor are given a year's membership in the American Association for the Advancement of Science.

Professor Ralph W. Lefler, Purdue University, was called upon to speak about the State Science Talent Search. Professor Lefler explained that the National Science Talent Search selects forty winners who are given a trip to Washington, D. C. From this group two national winners each receive a four year college scholarship of \$2,800 and \$2,000 respectively. Eight more winners receive \$400 each and \$3,000 additional in scholarships is awarded.

Last year Indiana had sixty-one entries who completed all of the requirements. Eight of the students received honorable mention and two were in the group of forty who went to Washington, D. C. The total in scholarship funds received by Indiana students who have been winners in the State Science Talent Search represents \$29,600.

Thirty-nine high school science clubs are affiliated with the Indiana Junior Academy of Science. The number of active clubs has doubled in the past five years. It is believed that many other high schools of Indiana would benefit through participation in the work of the Junior Academy.

After expressing his thanks to those who took part in the program and to everyone who attended, President David Brenner adjourned the 1952 meeting.

Over two hundred club members, sponsors and guests registered for the meeting. It was the largest attendance the Junior Academy has enjoyed at an annual meeting.

EXHIBITS

Sun Spots; Living Reptiles: Junior Academy, Elkhart High School, Elkhart.

Telephone Switchboard: Science Club, Hobart High School, Hobart.
Noise Suppression in High Fidelity Reproduction; Tape Recorder; Oscilloscope; Blast Furnace for Production of Pig Iron: Phy-Chem Club, Elmhurst High School, Fort Wayne.

Insect Collections; Drying Boards for Insects; Leaf Collections: Biology Club, Lew Wallace High School, Gary.

Insect Collection: Biology Club, Tolleston High School, Gary.

Chemistry of Coal; Distillation of Crude Oil: Science Club, State High School, Terre Haute.

Common Rocks and Their Cycle: Science Club, New Castle High School, New Castle.

INDIANA JUNIOR ACADEMY OF SCIENCE CLUBS

FALL 1952

<i>Town</i>	<i>School and Club</i>	<i>Sponsor</i>
1. Anderson,	H. S., Science (1936)	B. B. Horton
2. Attica	H. S., Sci.-Math. (1949)	J. Claude Daugherty
3. Bedford	H. S., Science (1951)	Robert E. Carpenter
4. Bloomington	H. S., Nat'l Scientific Honor Society (1931)	Harold Stewart
5. Bloomington	University H. S., Jr. Academy (1938)	E. Wayne Gross P. L. Whitaker
6. Clayton	H. S., Jr. Academy (1951)	Howard C. Lewis
7. Crawfordsville	H. S., Up-N-Atom (1950)	David Wells
8. Elkhart	H. S., Jr. Academy (1940)	Evelyn Wagoner
9. Ft. Wayne	Central H. S., Nature (1940)	Iva Spangler
10. Ft. Wayne	North Side H. S., Nature, (1936)	Vesta Thompson
11. Ft. Wayne	Elmhurst H. S., Phy-Chem. (1935)	Ruth Wimmer
12. Gary	Edison H. S., Beaker Breakers (1947)	Mrs. Martha B. Connor
13. Gary	Lew Wallace H. S., Biology (1935)	Lola Lemon
14. Gary	Lew Wallace H. S., Klub Kem (1941)	Mrs. Helen McKenzie
15. Gary	Tolleston H. S., Biology (1952)	Edith Wallace

<i>Town</i>	<i>School and Club</i>	<i>Sponsor</i>
16. Gary	Tolleston H. S., Future Scientists of America (1949)	Juanita Joice
17. Gary	Wirt H. S., Biology (1945)	Mrs. Frances Huddleston
18. Gas City	H. S., Science (1936)	Roy McKee
19. Hammond	Morton School, Science (1949)	Faye E. Moorman
20. Hobart	H. S., Science (1952)	Lola Stewart
21. Huntingburg	H. S., Science, (1949)	Wilmer K. Pellett
22. Indianapolis	Shortridge H. S., Science (1931)	Henrietta A. Parker (Mrs.)
23. Indianapolis	Shortridge H. S., Nature (1947)	Max Forsyth
24. Indianapolis	Technical H. S., Nature (1932)	Howard L. Cook
25. Indianapolis	Howe H. S., Science (1949)	Jerry Motley
26. Indianapolis	Washington H. S., Science (1931)	Estil Van Dorn
27. Lafayette	Centennial School, Science (1948)	
28. Lowell	H. S., Science (1935)	Robert J. Brannock
29. Marion	H. S., Science (1936)	Keith Stroup
30. Mishawaka	H. S., Science (1936)	Darl F. Wood
31. New Albany	H. S., Science (1935)	L. S. Rose
32. New Castle	H. S., Science (1947)	Mary Rankin Garland Bookout
33. Richmond	H. S., Science (1950)	Kathryn Coulter Elma Eliason
34. South Bend	Central H. S., Jr. Izaak Walton & Chem. Club (1939)	A. L. Smith F. S. Sanford
35. Sullivan	H. S., Camera (1939)	Ruth Hinkle
36. Terre Haute	State H. S., Senior Science (1939)	Russell McDougal
37. Valparaiso	H. S., Science (1931)	Gerald Doeden
38. Gary	Calumet Twp. H. S. Science (1952)	Mrs. Catherine Dale
39. South Bend	John Adams H. S., Jr. Izaak Walton (1952)	Ernest Litweiler