

PROCEEDINGS
of the
Indiana Academy
of Science

Founded December 29, 1885

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Volume 73

1963
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RICHARD A. LAUBENGAYER, Editor
Wabash College
Crawfordsville, Indiana

•
Spring Meeting
May 10-11
Pokagon State Park

Fall Meeting
October 10-12
GOSHEN COLLEGE

Published at Indianapolis, Indiana
1964

1. The permanent address of the Academy is the Indiana State Library, 140 N. Senate Ave., Indianapolis 4, Indiana.

2. **Instructions for Authors** appear at end of this volume, P. 277.

3. **Exchanges.** Items sent in exchange for the Proceedings and correspondence concerning exchange arrangements should be addressed: John Shepard Wright Memorial Library of the Indiana Academy of Science
c/o Indiana State Library
Indianapolis 4, Indiana.

4. **Proceedings** may be purchased through the State Library at \$5.00 per volume.

5. **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.

6. The Constitution and By-Laws reprinted from v. 62 and the Membership List reprinted from v. 67, are available to members upon application to the Secretary. Necrologies reprinted from the various volumes can be supplied relatives and friends of deceased members by the Secretary.

7. 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 Biology Department, Wabash College, Crawfordsville, Ind.

Papers published in the Proceedings of the Indiana Academy of Science are abstracted or indexed in appropriate services listed here:

Annotated Bibliography of Economic Geology

Bibliography of Agriculture

Bibliography of North American Geology

Biological Abstracts

Chemical Abstracts

Chemisches Zentralblatt

Current Geographical Publications

Geological Abstracts

Mathematics Reviews

Metallurgical Abstracts

Psychological Abstracts

Review of Applied Entomology

The Torrey Bulletin

Zoological Record

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OFFICERS AND COMMITTEES
OFFICERS FOR 1963

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 Bacteriology RICHARD SMITH, Miles Ames Research Lab., Elkhart
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 Entomology GEORGE E. MARSHALL, Experiment. Hort. Orchard,
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 Mathematics ERNST SNAPPER, Indiana University
 Physics PAUL BENDER, Goshen College
 Plant Taxonomy JOSEPH HENNEN, Indiana State College
 Psychology WILLIAM MARTIN, Purdue University
 Soil Science GERALD E. WILCOX, Purdue University
 Zoology CARL KREKELER, Valparaiso University

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Carlson, K. H.	Johnson, R.	Porter, C. L.
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Cleland, R. F.	Kessel, W. G.	Rice, W.
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Cooper, R. H.	Kowitz, W.	Snapper, E.
Crowell, S.	Laubengayer, R. A.	Visher, S. S.
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DeLanney, L. E.	Markle, M. S.	Weatherwax, P.
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Edwards, P. D.	Maysilles, J. H.	Young, F. N.
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Girton, R. E.	Meyer, A. H.	Yuncker, T. G.
Guard, A. T.	Michaud, H. H.	

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(Consisting of President, Secretary, Treasurer, Editor; Chairmen of the Junior Academy, Library, Program, and Relation of Academy to State.) Howard H. Michaud, William W. Bloom, Kermit H. Carlson, Richard A. Laubengayer, Tom Overmire, Nelle M. Coats, Henry D. Weaver, Jr., William A. Daily.

COMMITTEES ELECTED BY THE ACADEMY

Trustees of the Academy Foundation: Chairman, Frank J. Welcher, Indiana University, Adult Ed. Center, Indianapolis (appointed to fill the unexpired term of Ward Rice—term expires 1964); William A. Daily (1965).

Bonding Trustees (elected yearly): Chairman, Scott McCoy, Technical High School, Indianapolis; F. J. Welcher, Indiana University, Adult Ed. Center, Indianapolis.

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Indiana Science Fairs: Director, L. A. Willig, Tri-State College; Regional Directors: Vincent Flannery, A. C. Koester, R. E. Niswander, W. A. Threlkeld, R. K. Lewton, Charles Hess, W. J. Brett, G. E. Doeden, R. M. Brooker, Paul Klinge, Brian Hill, D. H. Follett.

Indiana Science Talent Search: Director, Sears Crowell, Indiana University; L. H. Baldinger, J. M. Egar, Harold Garner, Vergil Heniser, Morris Taylor.

Indiana Junior Academy of Science: State Sponsor, Thomas Overmire, Ball State College; Council: Ervin Steincamp, Sister Suzanne, V. C. Cripe, Don Winslow, Helen Reed.

Indiana High School and College Committee on Mathematics: Chairman, J. C. Polley, Wabash College; G. N. Wollan, G. D. Vannatta.

Visiting Scientists: Chairman, William G. Kessel, Indiana State College; K. H. Carlson, R. H. Cooper, Elizabeth Crider, E. Litweiler.

SPRING MEETING

POKAGON STATE PARK

MINUTES OF THE EXECUTIVE COMMITTEE MEETING

May 10, 1963

The meeting was called to order by the president, Dr. Howard H. Michaud at 4:45 P.M. Sixteen members of the committee were in attendance.

The treasurer, Dr. Kermit H. Carlson, submitted his report as of April 30, 1963. A summary of his report is as follows:

State Academy Accounts

Balance as of Jan. 1, 1963	\$8,136.57	
Receipts to April 30, 1963	4,234.73	12,371.30
Disbursements to April 30, 1963		6,749.10
Balance in State Academy Accounts		5,622.20

National Science Foundation Accounts

Balance as of Jan. 1, 1963	\$12,566.58	
Disbursements		8,395.89
Balance as of April 30, 1963		4,170.69

Dr. Carlson reported on the costs of sending state winners and sponsors to the National Science Fair and that indications were that the income will be sufficient to meet these expenses. The treasurer's report was approved as read.

The editor, Dr. Richard A. Laubengayer was unable to attend but submitted the following report: 1800 copies of the Proceedings had been ordered, 1200 to be hard bound and 600 paper bound. The galley is in preparation and should be in the hands of contributors before the end of the month. The editor also submitted recommendations for meeting the cost of the publication of the Proceedings. Discussion of the recommendations was postponed to new business.

The press secretary, Dr. Frank N. Young, reported that the newspaper, radio, television, and wire services coverage of the fall meeting of 1962 had been good and that he would attempt to get as much coverage as possible for the fall meeting in 1963. He emphasized the necessity of his getting abstracts as soon as possible in the fall in order to secure the best news coverage.

Dr. Henry D. Weaver, as acting program chairman, reported everything in order for the meetings later in the day and for the Saturday field trips. He reported that the call for papers would be made early in August and that the final mailing of the programs would occur about October 1. September 7 was set as the deadline for receiving materials to be included in the printed programs.

In the absence of the membership chairman the secretary presented the fourteen applicants for membership in the Senior Academy and the one club application for membership in the Junior Academy.

The librarian, Miss Nelle Coats, reported that the Indiana State Library had forwarded copies of the Proceedings as issued to members of the Academy and that the Academy Library distributed copies of the latest volume to institutions on the exchange list in the United States and foreign countries. She also reported the action of the Budget Committee requesting her to make an inventory of the copies of the Proceedings on hand as well as the 50 Year Index and Indiana Scientists and to make available to the membership excess copies on a free, first-come basis.

Dr. Ray T. Everly, chairman of the Fellows Committee, reported on the study and recommendations made by his committee. He reported that there were one hundred eighty-eight members of the Academy who were Fellows and that certificates were being prepared for them.

Dr. Robert Cooper, chairman of the Invitations Committee, reported on the possible future host for the meetings as Wabash in 1964, Ball State Teachers College in 1965, and Notre Dame and Indiana Technical College in the near future. A motion carried to the effect that the Invitations Committee be guided by a suggestion that every third meeting be held somewhere near the center of the state.

The Research Committee reported that there were \$600.00 in the Research Grants Fund on Jan. 1, 1962; \$610 had been received from the A.A.A.S. and \$300.00 from the Academy Foundation, for a total of \$1510.00. During this time, Dr. Arthur Smucker received a grant of \$160.00 and Dr. Winona Welch received a grant of \$150.00 for a total of \$310.00 in grants. The balance in this fund available for research grants is now \$1200.00.

After some discussion of proposals made by the Editor concerning policies for the publication of the Proceedings, the following motion was approved by the Executive Committee:

No author may submit manuscripts totaling more than ten (10) doublespaced typewritten pages, including literature cited, and no more than two illustrations (tables, photographs, etc.) for a total of not more than twelve (12) pages of manuscripts without paying the addition costs of publication.

If any individuals are invited to submit manuscripts, it must be understood that they must be members of the Academy if they wish to have their manuscripts published in full. Also, their manuscripts would be subjected to the above rules. The contents of their manuscripts must fall within the range of material that is usually acceptable for publication in the Proceedings.

A motion carried to approve an allowance of not more than \$30.00 for the preparation and mailing of Fellows Certificates.

The meeting of the executive committee adjourned at 6:20 P.M.

WILLIAM W. BLOOM, Secretary

Approved October 10, 1963

SPRING MEETING

POKAGON STATE PARK

May 10, 1963

Following the dinner served in the main dining room of the Inn at Pokagon State Park, the formal business session of the Spring Meeting of the Academy was called to order in the lobby of the Inn by President Howard H. Michaud. The president then introduced the officers and special guests to the members present.

The proposed amendments to the Constitution and By-Laws which had been read for the first time at the Fall Meeting in 1962 was read for the second time. The proposed amendments were as follows:

In the second sentence of Article III of the constitution, the word *President-Elect* be substituted for *Vice-President*, and that the words *Membership Secretary* be added after the word *Secretary*. The sentence as amended would then read: "They (the officers) shall consist of a President, a President-Elect, Divisional Chairmen, a Secretary, a Membership Secretary, a Press Secretary, an Editor, and a Treasurer."

Section 2 of Article I of the By-Laws be replaced by the following: "Section 2. President-Elect. The President-Elect shall assume the office of President immediately following the last business session of the fall meeting of the Academy in the year in which he has served as President-Elect. During his term as President-Elect, he shall discharge all the duties of the chief executive officer in the absence of the President. He shall familiarize himself with all the operations of the Academy and prepare lists of committee appointments prior to assuming the office of President."

The following be adopted as Section 5 of Article I of the By-Laws, and that the numbering of the present sections 5 through 7 be changed to 6 through 8: "Section 5. Membership Secretary. The Membership Secretary shall assume all duties concerned with the maintenance of membership list and shall be prepared at all times to provide officers, committee chairmen, and sectional chairmen with lists necessary to their operations. He shall develop such forms as are necessary for keeping proper records of membership. He shall, at regular intervals, secure from the Secretary and the Treasurer the information necessary for maintaining these lists."

Section (m) of Article II of the By-Laws, which has been amended since its original adoption, be rewritten to read as follows: "Section (m). Committee on Fellows. Membership of the Committee on Fellows shall be limited to one representative from each division of the membership of the Academy. The term of office shall be three years. Beginning in 1963 with the divisions listed in alphabetical order, one-third of the members shall be appointed to serve for three years, one-third for two years, and the remaining group for one year. In subsequent years, these division

representatives shall be replaced when their terms expire with others appointed to serve for three years. Representatives of new divisions which shall be organized in the future shall be added to the group with the smallest number of appointees, and their terms of office shall expire with the terms of the others of that group. The chairman of the committee shall have had at least one year of service on the committee."

The following new section be added to Article II of the By-Laws: Section (n). Committee on Constitution and By-Laws. The duties of this committee shall be to justify all executive actions, to keep the constitution and By-Laws up-to-date, and to give advice and assistance in the preparation of proposed amendments. The committee shall consist of three members in rotating order, the chairman serving during the last year of his term. The chairman of the committee shall be a member ex-officio of the Council of the Academy.

The proposed amendments were approved and become a part of the Constitution and By-Laws of the Academy.

Fourteen applications for membership in the Senior Academy and one club application for membership in the Junior Academy were approved.

The program for the evening was then presented. It consisted of photographic sketches from field and laboratory prepared by Dr. S. W. Witmer, professor emeritus in Biological Science at Goshen College and represented kodochrome slides taken over a wide range of time and geographical area. Dr. Witmer himself was unable to make the presentation due to a very recent hospitalization and surgery, and Dr. Bishop of the Goshen faculty read the prepared script.

A motion carried expressing special thanks to the management of the Inn, to Dr. Witmer and Dr. Bishop for their contributions to the program.

The members present also expressed their special concern for Dr. Witmer and extended him greetings and wishes for a speedy recovery.

Dr. Weaver announced the time and meeting places for the field trips to be held on Saturday morning, following which the meeting was adjourned.

WILLIAM W. BLOOM, Secretary

Approved October 10, 1963

MINUTES OF THE EXECUTIVE COMMITTEE MEETING

GOSHEN COLLEGE, Goshen, Indiana

October 10, 1963

The fall meeting of the Executive Committee was called to order by President Howard H. Michaud at 7:40 P.M. Twenty-four members were present.

The minutes of the Spring meeting of the Executive Committee and the General Session of the Academy held on May 10 at Pokagon State Park were read and approved.

Treasurer—Dr. Kermit Carlson: A summary of the financial report as of Sept. 30 is as follows:

Jan. 1 balance plus receipts in State Accounts as of Sept. 30, 1963—\$20,660.66; disbursements \$14,474.77; present balance \$6,185.89.

Jan. 1 balance plus receipts in NSF funds as of Sept. 30, 1963—\$13,026.58; disbursements—\$11,522.81; balance as of Sept. 30, 1963—\$1,503.77.

FINANCIAL REPORT OF THE INDIANA ACADEMY OF SCIENCE January 1, 1963 thru December 31, 1963

<i>Account Name</i>	<i>Balance Jan. 1 Plus Receipts</i>	<i>Disbursed</i>	<i>Balance</i>
1. Indiana Academy Science (budget) . . .	8,513.04	6,243.55	2,269.49
2. Junior Academy	32.16	23.70	8.46
3. Academy Funds Designated for Research	1,500.00	300.00	1,200.00
4. J. S. Wright Memorial Library and Lilly Endowment Fund	768.06	22.25	745.81
5. Science Fair	8,433.15	8,241.53	191.62
6. Science Talent Search	2,324.42	1,251.09	1,073.33
Total in State Accounts	21,570.83	16,082.12	5,488.71
National Science Foundation General Fund Cash			
G 22464	12,566.58	11,676.70	889.88
Tax Held in Trust	13.30		13.30
G 12412	{ 3,180.71 }		
G 1846	{ 1,460.00 }	1,950.06	2,690.65
Total NSF	17,220.59	13,626.76	3,593.83
Total State and NSF	38,791.42	29,708.88	9,082.54
Bank Balances: Farmers State Bank		4,988.95	
First Federal Savings and Loan Assn.		4,093.59	
		9,082.54	Balance

Kermit H. Carlson, Treasurer
December 31, 1963

We have examined these accounts this date, Jan. 18, 1964, and have found them to be accurate and in order.

Auditing Committee
R. J. Hanson
Clarence Dineen

Editor—Dr. Richard A. Laubengayer: Dr. Laubengayer reported that 1,200 hard bound and 600 paper bound copies of Volume 72 has been delivered and were ready for distribution. The reprints are already in the mails and should be in the hands of the contributors.

Press secretary—Dr. Frank N. Young: Dr. Young reported that notices of the spring and fall meetings were sent to newspapers, wire services, and radio and television stations over the state. The news bureaus of all institutions with members participating in the Academy programs were informed and requested to release local publicity.

The Trustees of the Academy Research Endowment Fund: W. A. Daily, chairman, protem reported as of Oct. 1, 1962, a beginning balance of \$1,017.81; total receipts Oct. 1, 1962 to Sept. 12, 1963—\$676.98; disbursements were \$846.01 leaving an ending balance of \$848.78. The total carrying value of the fund was \$15,559.46.

The Research Grant Committee: Two grants were made during the past year as follows: Dr. Winona Welch—\$150; Prof. J. O. Whitaker, \$150. Approximately \$1000 is available for grants.

Youth Activities Committee—Paul Klinge, Chairman:

A. **Science Fairs—**The State Director, Dr. L. A. Willig, has resigned after unusually outstanding service in this capacity. He has been largely responsible for the fund raising involved in this program which is a large task. His responsibilities also include the state organization, publicity, posters, meetings, National Science Fair trip, etc.

He has announced his resignation. The Academy is certainly deeply in debt for his unselfish and untiring efforts which have been so productive.

Winners from all 12 Regionals, and their teachers, participated in the National Science Fair at Albuquerque, the first week in May, 1963.

President Michaud has appointed Dean Karl Kaufman, College of Pharmacy, Butler University, Indianapolis, to the post of State Director.

B. **Junior Academy of Science—**Professor Thomas Overmire, Ball State Teachers College, Muncie, has been appointed as State Sponsor to replace Professor Michaud. Mr. Erwin Steinkamp, New Albany High School, New Albany, replaces Mr. Robert Weber on the Council.

C. **Science Talent Search—**Professor Virgil Heniser, Coordinator for School Science, Indiana University, Bloomington, has been appointed Director to replace Professor Sears Crowell. Professor Morris Taylor, Department of Physics, Purdue University, has been appointed to replace Professor Henry, Wabash College, on the Committee.

The Junior Scientists Assembly was held at the Indiana University Medical Center in Indianapolis in March, 1963. Tri Kappa sorority continues to provide the financial support for this program.

The budget remains the single most formidable problem in the operation of these programs. It still remains an unsolved problem if hand-to-mouth financing is ever to be eliminated.

Mr. Robert Kent, NDEA Science Consultant, Indiana State Department of Public Instruction, in consultation with President Michaud and Professor Klinge, has proposed to the U. S. Office of Education a modest grant for the support of the Youth Activities Committee. This is not intended to eliminate the budgetary problems of the separate programs, however.

The Committee Chairman, directed by the Committee, has prepared informational material for the use of school administrators and teachers for all state science activities.

Auditing Committee: Dr. Carlson reported that the Auditing Committee had audited and approved the financial records as of Dec. 21, 1962.

Biological Survey Committee, C. A. Markle, Chairman:

Publications of 1962-1963

Dealing with the Flora and Fauna of Indiana

- | | |
|------------|---|
| Algae: | 1. Daily, W. A., 1963. Notes on Algae found in Indiana. Proc. Inc. Acad. Sci., Vol. 72: |
| | 2. Hall, C. R., 1963. Notes on Indiana Algae, Primarily from Putnam County. Proc. Inc. Acad. Sci., Vol. 72: |
| Bryophyta: | 1. Lantz, Larry A., 1963. Acrogynous <i>Jungermanniales</i> ; A Taxonomic Treatment of the species occurring in Indiana. Submitted as a thesis for A.M. degree, DePauw, June 1963. In DePauw Library. |
| | 2. Welch, Winona H., 1963. Bryophytes of Cabin Creek Raised Bog. Proc. Ind. Acad. Sci., Vol. 72: 105-107. |
| | 3. ———, 1963. <i>Fontinalaceae</i> . (Ind. species are included.) North American Flora, Series 2, Part 3: 1-51. |
| | 4. ———, 1963. Studies in Indiana Bryophytes XIII. Proc. Ind. Acad. Sci., Vol. 72: 270-278. |
| Insecta: | 1. Siverly, R. E., 1962. Occurrence of <i>Culex territans</i> Walker in Indiana. Proc. Ind. Acad. Sci., Vol. 71: 115. |
| Aves: | 1. Many Contributors, 1962-1963. Regional and Field Reports. Indiana Audubon Quarterly Vol. 40-41. |

Work in Progress or Completed, but not yet Published,

Dealing with the Flora and Fauna of Indiana

- | | |
|-----------------|--|
| Vascular Plants | 1. Jackson, M. T. and A. A. Lindsey. Effects of microclimates on the flowering phenology of spring flowering plants in central Indiana. |
| | 2. Markle, Carrolle A., Norman Richardson and Mary Beth Schnur. Contributions to the Flora of Wayne County, Indiana. |
| | 3. Petty, R. O. and D. Harwood. Rush Woods, a Lowland Extension of the Beech-Maple Climax, Montgomery Co., Indiana. Proc. Ind. Acad. Sci., Vol. 73. |
| | 4. Petty, R. and E. Williams. Cycling of Radioisotopes in a central mesophytic forest, Allee Memorial Woods, Parke Co., Indiana. Publication: Special reports AEC. Proc. Ind. Acad. Sci., Vol. 73. |
| | 5. Schmelz, Damien and A. A. Lindsey. Phytosociological comparisons among old-growth forests of Indiana. |

6. Witmer, S. W. A New Station for *Butomus umbellatus* L. in Indiana.
- Annelida: 1. Joyner, James J. Earthworms of Indiana.
- Crustacea: 1. Cole, Ronald. Crayfish of Middle-Eastern Indiana.
2. Gammon, James. Distribution of Crayfish in Streams of Putnam County, Indiana and vicinity.
3. Wise, Charles D. Ostracods of Indiana.
- Insecta and Arachnida: 1. Siverly, R. E. Taxonomic and Ecological Studies of Mosquitoes of Indiana.
2. Ward, Gertrude L. Spiders of Indiana.
3. Ward, Gertrude L. and Jean Allen, Terrence Marsh, Lee Reynolds, Nancy Bourke. Insects of Whitewater Valley, Indiana.
- Pisces: 1. Cope, James B. and Edward Gardella. Collection and Identification of Fish of Whitewater Valley.
2. Gammon, James R. Distribution of fishes in the streams of Putnam County, Indiana and vicinity.
3. Proffitt, Max A. Collection and classification of the pisces in region of Terre Haute, Indiana.
- Aves: 1. Cooper, Robert H. Further notes on the Occurrence of the Whistling Swan (*Cygnus columbianus* L.) in Delaware County, Indiana. Proc. Ind. Acad. Sci. Vol. 73.
2. Cope, James B. Bird Migration Studies.
3. Cope, James B. and William Buskirk. Birds of Indiana.
4. Indiana Audubon Society Members; Several Contributors. Work and field notes on birds of Indiana. To be published in Indiana Audubon Quarterly.
- Mammalia: 1. Cope, James B., Stephen Humphrey and John Whitesell. Bat Migrations and other studies on bats in Indiana.
2. Whitaker, John O. Collections of the mammals in region of Terre Haute, Indiana.
- Miscellaneous Plant and Animal Groups: 1. Klotz, John W. "Of Bogs and Logs." Biweekly in the Sunday Magazine section of the Ft. Wayne Journal Gazette. Deals with biological phenomena with special reference to northeastern Indiana.
2. Authors Various. ACRES BULLETIN (Quarterly). Short articles on biological phenomena of interest to members.

Fellows Committee—Dr. Ray T. Everly, reporting for the Fellows committee, recommended the following for election to the status of fellow in the Academy: James Cope, Richard Louis Conklin, George B. Cummins, Robert Ledyard Henry, R. Emerson Niswander, and Howard Ray Youse. The recommendations were approved.

He also reported that certificates were prepared and mailed to 188 Fellows of the Academy who had been elected prior to 1962.

A number of recommendations concerning the election of fellows was referred to the Constitution revision committee for consideration.

Invitations Committee—Dr. Robert Cooper, chairman: Dr. Cooper reported that Indiana Central College had invited the Academy to hold its 1964 fall meeting at Indiana Central College. Notre Dame had previously expressed interest in serving as host in the near future. The executive agreed to accept the invitation of Indiana Central for 1964 and that of Notre Dame for 1965 if a formal invitation is received.

Library Committee—Nelle Coats, chairman, submitted the following report for the John Shepard Wright Memorial Library:

For use primarily as display material the following items were purchased on the John Shepard Wright Fund, the selection honoring one of Mrs. Wright's interests: British Museum, Eggs of British Birds, 5 volumes; Poynting, Eggs of British Birds; Smythies, Birds of Borneo; Smythies, Birds of Burma; and Tweedie, Malayan Birds. Separate plates from Brasher's Birds of North America and from Walcotts, Wild Flowers of North America, were acquired.

Authorized by the Budget Committee, 220 volumes from the Academy's serials were prepared for binding at a cost of \$1000.00.

An inventory of Proceedings available was made and forwarded to the Secretary and where the number on hand so justified these were offered to the members as a gift.

As the Library consists chiefly of scientific and technical serials, some titles not too commonly held, its use is largely by loan to other libraries citing references in bibliographic tools. Among libraries outside the state requesting materials were those of such widely separated institutions as Michigan State University, University of Utah, Shell Development Co., Houston, Texas, Taft Sanitary Engineering Center, Cincinnati, Ohio, University of Illinois, and the Mobil Chemical Company of Metuchen, New Jersey.

Thirty-three new titles have been added.

In the absence of necrologist Dr. W. E. Edington, Dr. Winona Welch reported that four members of the Academy had passed away during the past year and would be reported on in the Friday sessions. They were: Scott V. Eaton, Thomas Lane, Harold Morrison, and Ward J. Rice.

Relation of Academy to State—W. A. Daily, Chairman: Dr. Daily reported that the Indiana State legislature has appropriated \$4000 per annum to publish the Academy Proceedings for the years 1963 and 1964.

Dr. W. H. Johnson who served as the Academy representative on the AAAS Council reported that he had attended the council sessions in 1962 at Philadelphia and that the minutes of these sessions were published in Science.

Junior Academy—Dr. Thomas Overmire, State Sponsor: Dr. Overmire reported on a study he had made concerning the accomplishments of the 33 Junior Academy Best Girl and Best Boy awards: There are 5 with the Ph.D.; 1 with a M.D.; 3 with the M.A. or M.S.; 2 with the B.S. or B.A.; 3 are working on the Ph.D.; 2 on the M.A.; and 4 are undergraduates. Eight more had some college work.

Constitution Revision Committee—Dr. Paul Weatherwax, chairman: Dr. Weatherwax reported that the work on the revision was progressing and noted the need for expert legal help to be sure we met the legal requirements of non-profit corporations. He recommended that the present committee be reappointed or a new one appointed to continue the work.

Bonding Committee—Mr. Scott McCoy: Mr. McCoy sent in his report to the effect that the bond of the treasurer and trustees is in good order and would be renewed before its expiration date in Nov., 1965.

Visiting Scientists—Howard H. Michaud: Dr. Michaud submitted an extensive report for the files of the Academy. He reported a steady increase in participation in the program during the four years it has been in operation. During the first year 177 visits were made; 211 in the second; 238 in the third; and 246 last year. The most frequent requests are for visitors in the areas of Biology, Chemistry, Math, and Physics, in that order.

A motion was approved to recommend that the resolutions committee draw up appropriate resolutions recognizing the services of Dr. Leslie Willig as Director of Science Fairs, Dr. Sears Crowell as Director of the Indiana Science Talent Search, and Prof. Howard H. Michaud as state sponsor of the Junior Academy and director of the Visiting Scientist program.

Nomination Committee: The committee reported the nomination of Dr. Donald Cook and Mr. Scott McCoy as members of the Bonding Committee and that A. A. Lindsey be renominated as a member of the Research Grants Committee to succeed himself. The nominations were approved.

It was announced that Dr. W. P. Morgan had been appointed by Pres. Michaud to fill the unexpired term of Mr. Ward J. Rice as trustee of the Academy Foundation and that he would act as Chairman.

After considerable discussion on the cost of publishing the Proceedings and the immediate need of funds to meet the present printing bill, a motion was approved to transfer \$600.00 from the Research Grants Account to the General Academy Budget Account.

A motion carried that the president appoint a committee to investigate ways to increase income either by dues increases or other means and report at the spring meeting.

The following recommendations were made by the Research Grants Committee:

Each applicant shall—

—submit 5 copies of his application to the Chairman of the Research Grant Committee, preferably at the annual fall meeting of the Academy.

—have been a member of the Academy for at least two (2) years at the time of the application. In the case of graduate students, the major professor, if qualified by membership, may make the application and be responsible for the project.

—be carrying on his project within the State of Indiana, and, if in the field of our natural resources or biota, be related to Indiana materials.

In general, the Committee will give priority to applicants at smaller institutions inasmuch as research funds are much less available there than at the larger state school. These recommendations were approved.

The meeting adjourned at 11:10 P.M.

WILLIAM W. BLOOM, Secretary

Approved 10-11-63

MINUTES OF THE GENERAL SESSION

October 11, 1963

The regular annual meeting of the Indiana Academy of Science was held in the Union Auditorium of Goshen College, Goshen, Indiana on October 11, 1963 at 9:30 A.M. The meeting was called to order by President Howard H. Michaud. Dr. Paul Mininger, President of Goshen College, welcomed the Academy to the campus. The minutes of the Executive Committee meeting of Thursday, October 10, 1963 were read by the secretary and approved as read.

In the absence of Dr. Will E. Edington, Academy Necrologist, Dr. Winona Welch read a brief biographical sketch of members who had died since the last annual meeting. These sketches are printed elsewhere in the proceedings.

As the main speaker at the general sessions, Dr. Richard M. Fagley, Executive Secretary, Commission of the Churches on International Affairs, The World Council of Churches, presented a very stimulating address on "The World's Expanding Populations".

The meeting adjourned at 11:00 for the beginning of the section meetings.

The annual dinner meeting of the Indiana Academy of Science was held in the Alumni Memorial Dining Room of Goshen College. Dr. Edward L. Haenisch, Vice-president of the Academy, presided. He introduced the guests and officers at the speaker's table and gave special recognition to out-of-state guests.

In the absence of Dr. L. E. DeLanney, Chairman of the membership committee, the secretary presented the applications of 38 individuals for membership in the Senior Academy. The applications were approved.

Dr. Lawrence Baldinger presented the following resolutions to the Academy which were approved:

- 1) That the secretary be requested to convey to Dr. Paul Mininger, President of Goshen College, the thanks of the Indiana Academy of Science for his cordial welcome, for the gracious hospitality of the institution, and for the efficient handling of the section meeting arrangements and facilities by Dr. Glen Miller, Chairman of the Program Committee, and his co-workers, Paul Bender, C. Franklin Bishop, Henry Weaver, Jr., Lester Zimmerman, and Jacob Swartzendruber, all of Goshen College, the personnel of the Alumni Memorial Dining Hall for their services in our behalf, and the committee for the Chapel Lecture Series which enabled us to hear Dr. Richard M. Fagley speak on "The World's Expanding Population" in the morning session.
- 2) That the secretary convey in writing to Dr. T. G. Yuncker of DePauw University, the thanks and best wishes of the Indiana Academy of Science for his long affiliation and sustained interest in

the affairs of the organization. Dr. Yuncker, formerly Chairman of the Department of Botany at DePauw University, has served the Academy as President and as a member of the Research Grants Committee. In his retirement and in spite of his recent illness, Dr. Yuncker has retained a keen interest in his scientific endeavors and in the welfare of the Academy. We wish him well ad multos annos.

3) That we make mention with special thanks the work of those members of the Academy whose interest and energies through the years have been directed toward stimulating the members of the younger generation into scientific careers and into membership in the Indiana Academy of Science, and that while we accept with regret the resignation from their endeavors with these young folks, this in order to undertake duties in their respective institutions, we do so with the hope that their good example will serve as a pattern and as a stimulus to the newer and younger members of the Academy for continuing this work with out budding scientists in the teen-age bracket.

4) That we note for commendation the work of the various special committees appointed by the president which has tended to improve the internal structure, to preserve the aims and purposes, and to present a purposeful external image of the organization for our members, and which has helped to enhance the general prestige of the Academy to the general public.

Dr. R. E. Girton, chairman of the Nominating Committee, presented the names of the divisional chairmen which had been elected in the divisional meetings earlier in the day. They are as follows: Anthropology, Wesley R. Hurt, Bloomington; Bacteriology, Robert Deufel, Indianapolis; Botany, P. A. Orpurt, North Manchester; Chemistry, Quentin Petersen, Crawfordsville; Entomology, Gertrude Ward, Earlham; Geology & Geography, J. Fraser Hart, Bloomington; History of Science, A. T. Guard, West Lafayette; Physics, Constantine Koltitshew, Indianapolis; Plant Taxonomy, Robert Petty, Crawfordsville; Soil Science, John M. Robbins, Cannelton; Zoology, Robert H. Cooper, Muncie.

Dr. Girton then presented the slate for officers to be elected by the Academy. The slate consisted of the following: President, E. L. Haenisch, Crawfordsville; President-elect, F. J. Welcher, Indianapolis; Secretary, C. F. Dineen, St. Mary's College, Notre Dame; Treasurer, J. C. List, Muncie; Editor, R. Laubengayer, Crawfordsville; Membership Secretary, Carrolle Markle, Richmond; Press Secretary, F. N. Young, Bloomington; Member of the Research Grants Committee (5 years), A. A. Lindsey, West Lafayette; Members of the Committee for Bonding Trustees, Scott McCoy, Indianapolis and Donald J. Cook, Greencastle. A motion carried instructing the secretary to cast a unanimous ballot for the slate.

Following the conclusion of the business session, President Howard H. Michaud presented a challenging and informative address on "Science and the Conservation of Our Natural Resources."

Following the presidential address the meeting was adjourned.

WILLIAM W. BLOOM, Secretary

NEW MEMBERS—1963

Bailey, Dennis R., 2159 Waynoka Road, Euclid 17, Ohio	Z
Baumgart, Prof. John K., Mathematics Dept., Manchester College, North Manchester, Ind.	M
Bishop, Dr. C. Franklin, Goshen College, Goshen, Indiana	Bo
Bubelis, Walter, 513 S. Washington, Crawfordsville, Ind.	Bo
Burnham, Dr. Kenneth D., 3914 Burton Drive, Muncie, Ind.	Z
Carmony, Paul E., R. R. 3, Box 102, Alexandria, Ind.	E
Carroll, Dr. Henry, Indiana State College, Terre Haute, Ind.	Ph
Cole, Miss Victoria A., 1250 Meadowbrook Drive, Indianapolis 40, Ind.	A
Colins, Miss Janice Anne, 8944 Southmoor Ave., Highland, Ind.	A, Bo, Z
Cook, Timothy E., 1600 Manhattan Ave., Muncie, Ind.	Bo
Cowan, John D., Hort. Dept., Purdue University, Lafayette, Ind.	SS
Crosley, Theodore V., R. R. 2, Fairmount, Ind.	G
Dalgleisch, David L., III, 16 East Prairie Parkway, Brownsburg, Ind.	Bo, Z
Dassel, Herschel G., 1310 North Boeke Road, Evansville 11, Ind.	Ph
Derf, James R., 1013 Bayless, Plymouth, Ind.	G
Fraker, Mark Arnott, 204 East Drive, Lebanon, Ind.	Z
Frisch, Jack A., 125 North Roosevelt, Bloomington, Ind.	A
Furlow, John J., 2441 McLeay Drive, Indianapolis 20, Ind.	Bo, PT
Gaar, Mrs. Suzanne, 3003 E. 5th St., Anderson, Ind.	Z
Gibbs, Ronald K., Room 121, Jordan Hall, Indiana University, Bloomington, Ind.	Bo
Girdley, William Arch, 1155 Texas Ave., Grand Junction, Colo.	G
Godfrey, Martin R., 130 Martinsville St., Greencastle, Ind.	Z
Green, Miss Mary Jane, 3709 East St., Cincinnati 27, Ohio	Bo
Hannah, Peter R., 1517 "O" Street, Bedford, Ind.	SS
Harwood, Daniel L., 211 N. Grace, Crawfordsville, Ind.	Bo, Pt, Z
Heidt, Gary A., 1106 Bellevue Ave., South Bend, Ind.	Z
Hidy, Miss Carol L., 1401 N. Lesley, Indianapolis 19, Ind.	Bo, E, Z
Hile, Mrs. Jerry, 6 Judith Lane, Terre Haute, Ind.	Bo
Holliday, William G., 8618 Parkway Drive, Highland, Ind.	Z
Hosseinie, Mrs. Shidokht (Ostovany) 208 Evermann Apts., Bloom- ington, Ind.	E, Z
Huber, John J., 504 N. McKinely, Muncie, Ind.	Ba, Bo, C
Hurt, Dr. Wesley R., 150 Maxwell Hall, Indiana University Museum, Bloomington, Ind.	A

Jackson, Marion T., 2706 Underwood St., Lafayette, Ind.	Bo
Kaufman, Dr. Karl L., College of Pharmacy, Butler University, Indianapolis 7, Ind.	HS
Kitchell, James F., R. R. 7, Valparaiso, Ind.	Ba, Z
Lennis, Larry J., 103½ S. Walnut St., Yorktown, Ind.	Ba
LeVon, Miss Carolyn Sue, 522 N. Calvert, Muncie, Ind.	Bo, E
Lincoln, William Edward III, 12 N. Temple, Indianapolis 1, Ind.	C
Litto, Mrs. Ines Maria F., Hoosier Cts A-s, Bloomington, Ind.	A
Louis, Dr. Nicholas B., Box 130, Valparaiso University, Valparaiso, Ind.	Ps
McClary, Charles F., Bosse High School, 1300 Washington Ave., Evansville, Ind.	C
McCracken, Mrs. Jean E., 1361 Third Ave., Terre Haute, Ind.	Bo
McDowell, Miss Janey Mae, 2001 Anna Drive, Elkhart, Ind.	HS
McFarland, Dr. John William, Chemistry Dept., DePauw University, Greencastle, Ind.	C
Maysilles, Prof. James H., Box 63, Hanover College, Hanover, Ind.	Bo, PT, E
Miller, Stephen A., 2011 N. 9th St., Terre Haute, Ind.	Z, E
Mislivec, Philip B., 522 N. 7th St., Clinton, Indiana	Bo
Oliver, Dr. Montague M., 1111 E. 19th Ave., Gary, Ind.	Z
Olson, George B., 2322 S. 14th St., Niles, Mich.	Ba
Orr, Alan R., Dept. of Biological Science, Purdue University, Lafayette, Ind.	Bo
Patterson, Prof. Fred L., Dept. of Agronomy, Purdue University, Lafayette, Ind.	Bo
Peters, Dr. Dennis G., Dept. Chemistry, Indiana University, Bloomington, Ind.	C
Pleasant, Julian R., Lobund Laboratory, University of Notre Dame, Notre Dame, Ind.	Ba
Predey, Dr. Thomas, 912 E. 167th Place, South Holland, Ill.	Z
Pryor, Prof. William A., Dept. of Chemistry, Purdue University, Lafayette, Ind.	C
Quigley, Stephen Robert, 1305 S. 6th St., Terre Haute, Ind.	G
Reddy, Dr. Bandrau Sivarama, P. O. Box 447, Notre Dame, Ind.	Ba, C
Reedy, Richard L., R. R. 2, Box 284, Middleton, Ind.	E
Reuther, Ronald T., 1009 Merchants Bank Bldg., Indianapolis 4, Ind.	Z, G
Rice, Dr. Francis Owen, Radiation Laboratory, Univ. of Notre Dame, South Bend, Ind.	C
Rippy, Charles Lewis, Dept. of Zoology, Univ. of Kentucky, Lexington, Ky.	Z
Rubin, David, Division of Science, Indiana State College, Terre Haute, Ind.	Z

Schmidt, Miss Susan K., R. R. 1, 315 Carroll Rd., Ft. Wayne, Ind.	Bo, E
Schneider, Dr. Allan F., Indiana Geological Survey, Indiana Univ., Bloomington, Ind.	G
Seagrave, Miss Diane S., 119 E. Grant, Greentown, Ind.	Bo, Z
Shands, Prof. Henry L., Dept. Botany and Plant Path., Purdue Univ., Lafayette, Ind.	Bo
Shade, Richard Evan, Dept. of Entomology, Purdue Univ., Lafayette, Ind.	E
Smith, Dr. Charles E., Jr., Ball State Teachers College, Muncie, Ind.	Z
Smith, David Lee, 2006 Burlington Dr., Muncie, Ind.	A, G, Z
Smith, Dr. Samuel W., 126 Gilbert Ave., Terre Haute, Ind.	G
Springer, Charles S., Jr., 100 W. Norwich St., Columbus, Ohio	C
Steinkamp, Erwin A., 817 Randolph Ave., Clarksville, Ind.	Z
Stratton, James Forrest, 342 S. 6th St., Clinton, Ind.	G
Talbott, Jan L., 1910 W. Second St., Marion, Ind.	Z
Topping, James A., 1005 S. 19th St., Terre Haute, Ind.	Z
Trankle, Dr. Robert J., Dept. of Biology, Franklin College, Franklin, Ind.	Bo
Tucker, Gary R., 3101 Petty Road, Muncie, Ind.	Z
Turner, Roosevelt, Univ. of California, Davis, Calif.	SS
Von Meyer, William C., 1504 Port Jefferson Road, Sidney, Ohio	Bo
Wise, Dr. Charles D., Dept. of Science, Ball State Teachers College, Muncie, Ind.	
Withenbury, Miss Lesley, 110 Oak St., Glendale 46, Ohio	Z
Yunker, Philip L., 3319 Oak Ave., Terre Haute, Ind.	Ps

JUNIOR ACADEMY

Huntington High School Science Club, Huntington High School, Huntington, Ind.

INDIANA JUNIOR ACADEMY OF SCIENCE

OFFICERS FOR 1963

President: Kathryn Crider, North Central High School, Indianapolis
Vice President: John Gaiser, University High School, Bloomington
Secretary: Vicki Schmidt, Franklin Central High School, Acton

MEMBERS OF THE COUNCIL

Sister Suzanne, Chairman, Vincennes (1959-1963); V. C. Cripe, South Bend (1960-1964); Don R. Winslow, Bloomington (1961-1965); Helen Reed, Indianapolis (1962-1966); Erwin Steinkamp, New Albany (1963-1967).

PROGRAM OF THE THIRTY-FIRST ANNUAL MEETING

OCTOBER 12, 1963

Science Building, Goshen College, Goshen, Indiana.

8:30-10:00 A.M. Registration and Placement of Exhibits.

10:00-11:00 A.M. Conferences in Science and Mathematics by faculty representatives of Goshen College.

11:00-12:00 Noon. Visits to Instructional Facilities and Laboratories of Goshen College.

12:00 Noon. Luncheon, College Cafeteria.

1:15 P.M. General Assembly, Assembly Hall, Kathryn Crider, presiding.

Greetings, William Miller, Registrar of Goshen College.

Business Meeting, and Presentation of Awards.

1:30-3:30 P.M. Presentation of Papers.

Section A (Grades 11 and 12), Assembly Hall, President Kathryn Crider, presiding.

The following papers were read by members of the Junior Academy:

1. Microbial Enzymes that Produce Rancidity in Selected Fats and Oils, Deborah Gano, Science Club, Washington High School, Indianapolis.
2. The Sea in Our Future, Bert Guentert, Adams Walton Club, John Adams High School, South Bend.
3. Nucleotide Sequence Studies Using AMP as a Model Fibre and Subsequent s-RNA Extraction for Future Fractionation, Gary Gunther, Science Club, Washington High School, Indianapolis.
4. The effects of Heat on Stainless Steel and Titanium, Daniel M. Hoban, Albertus Magnus Science Club, Central Catholic High School, Fort Wayne.

5. Subcutaneous Induction of Malignant Melanoma in the Syrian Hamster with Cell-Free Extracts, Rhea Louise Keller, Phi-Chi Science Club, New Haven High School, New Haven.
6. Preliminary Program for the Use of a Formalized Language for the Assertion of 12-Note-Class Composition and Demonstration of Basic Acoustical Properties, Edward Long, E. Wayne Gross Academy of Science, University High School, Bloomington.
7. Thymectomization and the Effects of Thymus Heterographs, Gregory Lumbr, E. Wayne Gross Academy of Science, University High School, Bloomington.
8. Establishment of Indigenous Microbial Flora in the Intestine of Laboratory Mice, Janice Perryman, Sigma Mu Club, Franklin Central High School, Acton.
9. Triaxial Coordinate System, Jerry Shepherd, Science Club, Washington High School, Indianapolis.
10. Sensation and Perception of Vision, Don Van Hoy, National Scientific Honor Society, Bloomington High School, Bloomington.
11. The Succession of Protists and Associated Forms in a Fresh Water Culture, Kathryn Crider, North Central High School, Indianapolis.

Section B (Grades 8 to 10), Room 101, Science Building, Vice President John Gaiser, presiding.

12. A Comparative Study of Common Metals and Metallic Oxides Used as Catalysts in Liberating Oxygen, Jack C. Dahl, Sigma Mu Club, Franklin Central High School, Acton.
13. Photographic Dosimetry, Tom Elam, MSE Academy of Science, University Junior High School, Bloomington.
14. How to Make an Incubator, Eugene Fox, Biology Club, Lew Wallace High School, Gary.
15. City Limits—But Bacteria Can't Read, Alison Lumbr, MSE Academy of Science, University Junior High School, Bloomington.
16. Proving by the CLB Method that x-Rays Produce Lethal Mutations in *Drosophila*, Tulle Hazelrigg, Freshman Academy of Science, University High School, Bloomington.

Minutes of Indiana Junior Academy of Science

The thirty-first annual meeting of the Indiana Junior Academy of Science was held Saturday, October 12, 1963, on the campus of Goshen College, Goshen, Indiana. The meeting was attended by 164 members, sponsors and guests. Representatives of 16 member clubs were in attendance.

Conferences in science and mathematics were held at 10 A.M. by members of the faculty of Goshen College. The areas of science that were discussed are listed in the program. Junior Academy members found this part of the program to be especially interesting. Visits to the instructional and laboratory facilities of the college were made between 11:00 A.M. and 12:00 Noon.

Following luncheon in the College Cafeteria, the more formal part of the program began. The afternoon general session was held in the Assembly Hall of the college.

The meeting began at 1:15 P.M. with opening remarks by the president, Kathryn Crider. The Junior Academy was officially welcomed to the campus by Mr. William Miller, Registrar of Goshen College. Mr. Miller gave a brief, interesting comparison of Russian and American attitudes toward science. He also commented on the importance of science and stressed especially the need for scientists and science teachers.

The current officers of the Junior Academy were then introduced to the assembled members. In addition, two members of the Council, Miss Helen Reed and Mr. Don R. Winslow, were introduced. The president announced that Mr. Keith Hunnings of New Haven High School and Sister Marian Francis of Reitz Memorial High School, Evansville, have become members of the Council. These new Council members will replace Sister Suzanne, Vincennes and Mr. V. C. Cripe, South Bend.

The results of the election of officers for 1964 were as follows: President, Gary Gunther, Science Club, Washington High School, Indianapolis; Vice President, Bert Guentert, Adams Walton Club, John Adams High School, South Bend; and Secretary, Susan Mann, E. Wayne Gross Academy of Science, University High School, Bloomington. Balloting for the election of officers was conducted by mail a few days before the meeting. Each member club was entitled to one ballot.

The award for "Best Boy in Science" was given to Gregory Lumbra, E. Wayne Gross Academy of Science, University High School, Bloomington. "Best Girl in Science" awards were received by Kathryn Crider, North Central High School, Indianapolis, and Rhea Keller, Phi-Chi Club, New Haven High School, New Haven. The recipients of these awards were selected by the Council from a list of students who had been nominated by club sponsors. Personal interviews were included as part of the reviewing process. Recipients of the honor received one year memberships in the American Association for the Advancement of Science.

Dr. Thomas Overmire, State Sponsor of the Junior Academy, discussed briefly some results of a follow-up study that is being made of the 33 Junior Academy members who were judged "Best Boy or Best Girl in Science" between the years 1940 and 1960. Preliminary results of this survey show that at least six of this group have earned the doctorate, at least three others have earned the masters degree, at least two others have earned the bachelors degree, and at least nine others are currently in college.

Sixteen papers, as listed in the program, were read during the remainder of the program. The presentation of papers was held in two con-current sessions. Section A was for papers by students in the 11th or 12th grades, and Section B for students in grades 8 through 10. The papers represented a wide variety of topics. All of the papers were well received by the members in attendance at the meeting.

Following the session on papers, the president, Kathryn Crider, introduced Dr. A. S. Kester and Dr. C. E. Brownnewell of Miles Labora-

tories who were representing the American Society of Microbiologists. Dr. Kester and Dr. Brownell announced that the award for the best paper in the area of microbiology was to be given to Rhea Keller, Phi-Chi Club, New Haven High School, New Haven. The award consisted of a check for twenty-five dollars.

The president, speaking for the members of the Junior Academy, then thanked the faculty and representatives of Goshen College for their important part in the success of the day's program. It was announced that the 1964 meeting will be held at Indiana Central College in Indianapolis.

The meeting was adjourned at 3:30 P.M.

VICKI SCHMIDT, Secretary

INDIANA JUNIOR ACADEMY OF SCIENCE CLUBS

CURRENT LIST, FALL OF 1963

<i>Towns</i>	<i>School and Club</i>	<i>Sponsor</i>
Acton	Franklin Central, Sigma Mu (1958)	Jerry Colglazier
Bloomington	H. S., Nat. Scientific Honor Soc. (1931)	Merril L. Crisler
Bloomington	University Jr. H. S., MSE Club (1960)	Chas. Souers
Bloomington	University H. S., Freshman Acad. of Sc.	Bill Stucky
Bloomington	University H. S., E. Wayne Gross Acad. of Sc. (1938)	Lew Wise
Chesterton	H. S., Science (1954)	Robert McCord
Clarksville	Our Lady of Providence H. S., Phy-Chem (1956)	John Chilks
Clayton	H. S., Jr. Academy (1951)	Howard C. Leslie
Columbus	Jr. H. S., Academy of Science (1959)	Albert Sheets, Jr.
Columbus	Senior H. S., Science Club (1958)	L. N. Carmichael
Connersville	Alquina H. S., Science Club (1960)	Walter Gronning
Crawfordsville	H. S., Up-N-Atom (1950)	David Wells
Edinburg	H. S., The Alchemists (1954)	S. C. Harrell
Elkhart	H. S., Jr. Academy (1940)	Robert Mahan
Evansville	Reitz Memorial H. S., Phi Chi Mu (1958)	Sr. Francetta Sr. Peter
Fort Wayne	Central H. S., Biology (1940)	
Fort Wayne	Central Catholic H. S., Albertus Magnus Science Club (1952)	Sr. Winifred Sr. M. Magdelen S.P. Sr. Jean Margaret S.P.
Fort Wayne	Elmhurst H. S., Phy-Chem (1935)	Ruth Wimmer
Fort Wayne	North Side H. S., Nature (1936)	
Fort Wayne	South Side H. S., Jr. Acad. of Sc. (1956)	Robert Weber
Gary	Lew Wallace H. S., Biology (1935)	Lola Lemon
Gary	Lew Wallace H. S., Klub Kem (1941)	Helen McKenzie
Gary	Tolleston H. S., Biology (1952)	
Gary	Tolleston H. S., Future Scientists of America (1949)	Arthur Kline
Gary	Wirth H. S., Biology (1945)	Mrs. Frances Huddleston
Gas City	Mississinewa Joint H. S., Science (1936)	Roy McKee
Griffith	H. S., Science (1953)	George M. Bunce

<i>Towns</i>	<i>School and Club</i>	<i>Sponsor</i>
Hamlet	H. S., Science (1954)	Lawrence Cushman
Highland	H. S., Science (1961)	
Hobart	H. S., Science (1952)	Lola Stewart
Huntington	H. S., Science (1963)	Robert Diffenbaugh
Indianapolis	Fulton Jr. H. S., Science (1962)	Mrs. Berdine Proctor
Indianapolis	Howe H. S., Science (1949)	Jerry Motley
Indianapolis	Ladywood School, Guerin Science (1957)	Sr. Pauline Marie Sr. Louise
Indianapolis	Manual H. S., Sat. Morning Science (1962)	Wayne E. Dunbar Helen Reed
Indianapolis	Saint Agnes Academy, Science (1959)	Sr. Amelia
Indianapolis	Shortridge H. S., Naturalists' Club (1947)	Robert A. Weaver
Indianapolis	Shortridge H. S., Science (1931)	Mrs. H. A. Parker
Indianapolis	Technical H. S., Nature (1932)	Chas. E. Russell
Indianapolis	Washington H. S., Science (1931)	Mrs. E. H. Crider
Indianapolis	Westland Jr. H. S., Science (1959)	John Van Sickle
Jeffersonville	Clark and Floyd County Seminar (1959)	Dr. Richard L. Mauer Alan Drive New Albany, Indiana
LaPorte	H. S., Bi-Phi-Chem (1958)	Francis M. Gourley Byron Bernard
Lebanon	H. S., Jr. Explorers of Science (1953)	Tom Ewing
Loogootee	St. John H. S., Science (1959)	Sr. Mary Ellen
Madison	Fr. Michael Shawe Memorial H. S., Shawe Science (1957)	T. A. Winkel
Mishawaka	H. S., Science (1936)	
New Albany	H. S., Science (1935)	Erwin Steinkamp
New Castle	H. S., Science (1947)	Betty Jo Montag
New Haven	H. S., Phi-Chi (1954)	Keith Hunnings
Oldenburg	Imm. Conception Academy, Heterogeneous Geniuses (1958)	Sr. M. Constance
Richmond	H. S., Science (1950)	Von Alexander
Rossville	H. S., Science (1954)	Martin Silverthorn
Sandborn	H. S., Up and Atom (1954)	
South Bend	Central H. S., JETS (1939)	Lawrence K. Cox
South Bend	John Adams H. S., Adams Walton (1953)	Ernest Litweiler
Terre Haute	Schulte H. S., Pius X Science Teens (1961)	Sr. Thomas Mary
Vincennes	St. Rose Academy, Sigma Tau (1959)	Sr. Suzanne
Washington	Washington Catholic H. S., Aquinas Science (1958)	Sr. Marian Francis