

PROCEEDINGS

of the

Indiana Academy *of* Science

Founded December 29, 1885

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Volume 72

1962

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RICHARD A. LAUBENGAYER, Editor

Wabash College

Crawfordsville, Indiana

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Spring Meeting

May 18-19

Spring Mill State Park

Fall Meeting

October 18-20

EVANSVILLE COLLEGE

Published at Indianapolis, Indiana

1963

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.

3. **Exchanges.** Items sent in exchange for the Proceedings and correspondence concerning exchange arrangements should be addressed:

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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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- Indiana Science Talent Search:** Director, Sears Crowell, Indiana University; L. H. Baldinger, J. M. Egar, R. L. Henry, C. A. Markle.
- Special Constitution Revision Committee:** Chairman, Ray T. Everly, Purdue University; P. Weatherwax, W. A. Daily.

SPRING MEETING
SPRING MILL STATE PARK
MINUTES OF THE EXECUTIVE COMMITTEE
MEETING

May 18, 1962

President Harry G. Day called the Executive Committee meeting to order at 4:30 P.M. in the Inn.

Treasurer Kermit Carlson presented a report showing the beginning balances in the various budgeted accounts as of January 1, 1962, the receipts and disbursements, and the new balances as of May 15, 1962. The total balance in the Academy Accounts was \$4,830.30. He also presented a report on the status of the two N.S.F. grant accounts showing a balance as of May 15 of \$6,348.46. The treasurers report was accepted.

The chairman of the Youth Activities Committee reported on the Junior Activities of the Academy and pointed out the high cost of the Science Fair due to the fact that the National Science Fair was held at Seattle. He pointed out that the next National Science Fair will be held in New Mexico and noted the need to reassess the raising of funds to support the Science Fair activity. This year each regional fair was assessed \$500.00 for two students and two teachers. About \$5,000.00 was raised from contributions and other sources. Indiana did well at the National Fair, receiving two first places and a number of lesser awards, which was one of the best records in the nation.

Mr. Klinge announced that Howard Michaud has asked to be relieved of his duties in the Youth Activities program. Dr. Willig will continue to serve as state director of the Science Fair program. Mr. Klinge noted that Indiana also had a fine record in the Science Talent Search.

Editor Richard A. Laubengayer reported that galley proofs were being sent to contributors and that an early distribution of the Proceedings was anticipated. He pointed out that Volume 71 would also include a ten-year index and would be bound in red. He pointed out once more the need for Divisional Chairmen to follow the regulations concerning abstracts and manuscripts, which if followed, would ease the burden of the Editor.

Fellows Committee chairman Ray Everly presented an extensive report outlining proposed procedures for nominating fellows including qualifications in addition to those now mentioned in the constitution, and a form for nominations. Several constitutional changes were recommended to augment the recommendations of the committee. It was also proposed that the Academy have prepared a Certificate of Election as a Fellow. The report of the committee was accepted and filed by the secretary under the heading Fellows in the Academy files.

The following proposed change in the constitution was approved for presentation at the business meeting in the evening and for final reading at the annual meeting in the fall:

Article II, Section 3, Paragraph 1. Members who are actively engaged in productive scientific research with recognized standing in their field of endeavor, who have been members of this Academy in good standing for the past three years, and have demonstrated evidence of interest in the Academy, and/or have given dedicated service to encouraging youth in science in our colleges, universities, and secondary schools, upon recommendation by the Committee on Fellows, may be elected a Fellow of the Academy.

It was moved that the following paragraph change in the constitution be approved and presented to the fall meeting for adoption:

Article 3, Paragraph 2. Nominations for Fellows should be made on the approved form and signed by two Fellows of the Academy. All nominations must be in the hands of the Chairman of the Committee on Fellows not later than six weeks prior to the convening of the Executive Committee at the annual Fall meeting of the Academy. A three-fourths favorable vote of the members of the Executive Committee present shall constitute election as a Fellow.

A motion carried to amend the proposal to read that "A three-fourths favorable vote of the members of the Executive Committee present shall recommend the nominees to the assembly of the Academy for election."

The amended motion then was approved.

Invitations Committee chairman R. E. Siverly reported that Goshen College had invited the Academy to meet on their campus for the 1963 Fall meetings. The report of the committee was accepted and it was decided to accept the Goshen College invitation if details for the meetings can be worked out satisfactorily.

Press Secretary Frank N. Young reported that notices of the current meetings had been sent out to the various news media and that a report had been passed along to the Library. He noted that good radio and television coverage had been provided for the Fall meeting at Terre Haute.

Howard H. Michaud reported that in the Visiting Scientists Program 88 visitors from 20 colleges had received 254 assignments and that a fine response had been received from both high schools and visitors.

Paul Klinge pointed out the various curriculum studies underway and moved that the Program Chairman for the Fall meeting make plans for and issue suggestions to the sectional chairmen to include plans for curriculum studies in their programs. The motion carried.

Miss Nelle Coats reported that copies of serials received by the Academy had been distributed at the Junior Science Assembly. A report to the Lilly Endowment on the use of funds received from the endowment had been made.

A motion carried instructing the president to appoint a committee to study the constitution and by-laws and to make a report at the Fall Executive Committee meeting.

Twenty-two members were in attendance at the Executive Committee meeting.

The meeting was adjourned.

MINUTES OF THE DINNER MEETING

May 18, 1962

Following dinner in the main dining room of the Spring Mill Inn the evening business meeting was called to order by President Harry G. Day at 8:00 P.M.

The president introduced the current officers and the divisional chairmen present.

The proposed changes in the constitution and by-laws relative to elections of fellows as approved in the Executive Committee meeting were presented by the secretary for the first reading. The proposed amendments to the constitution are:

Article II, Sec. 3, Paragraph 1. Members who are actively engaged in productive scientific research with recognized standing in their field of endeavor, who have been members of this Academy in good standing for the past three years, and have demonstrated interest in the Academy, and/or have given dedicated service to encouraging youth in sciences in our colleges, universities, and secondary schools, upon recommendation by the Committee on Fellows, may be elected a Fellow of the Academy.

Article II, Sec. 3, Paragraph 2. Nominations for Fellows should be made on the approved form and signed by two Fellows of the Academy. All nominations must be in the hands of the chairman of the Committee on Fellows not later than six weeks prior to the convening of the Executive Committee at the annual Fall meeting of the Academy. A three-fourths favorable vote of the members of the Executive Committee present shall recommend the nominees to the assembly of the Academy for election.

Howard R. Youse, chairman of the resolutions committee presented a resolution which carried expressing the appreciation of the Academy to Mr. James C. Tusing, manager of Spring Mill Inn and his staff for all the arrangements and our thanks to the program chairman, speakers, and leaders of the field trips for their services.

Sixteen senior membership applications and one Junior Club application were approved.

Following the business meeting Dr. Glenn Black presented a most interesting illustrated talk with colored slides to illustrate the work on the Angel Mounds near Newburgh, Indiana which was followed by a lively discussion.

Dr. R. E. Siverly of Ball State Teachers College presented an interesting study of the life cycle of a mosquito amply illustrated by colored slides.

Ralph Coleman, chairman of the program committee announced that the field trips on Saturday morning would be conducted by J. Dan Webster of Hanover (birds), James Maysilles of Hanover (botany), Duncan McGregor of the Department of Conservation, Geological Survey (geology and soils), and Jack Munsee and William B. Hopp of Indiana State College (zoology).

WILLIAM W. BLOOM, Secretary

Approved 10-18-62

MINUTES OF THE EXECUTIVE COMMITTEE MEETING

EVANSVILLE COLLEGE, Evansville, Indiana
October 18, 1962

The Executive Committee meeting of the Indiana Academy of Science was held on October 18, 1962 in the Club Room of the Student Union of Evansville College. The meeting was called to order by the president, Harry G. Day, at 7:40 C.D.T.

The minutes of the Spring meeting of the executive committee and the general sessions held on May 18, 1962 at Spring Mill State Park were read by the secretary and approved as read.

Treasurer—Dr. Kermit Carlson presented the treasurer's report showing the balance in the various State Academy accounts as of January 1, the receipts and disbursements and the present balances as of September 30, 1962. The January 1 balance plus the 1962 receipts at this time amounted to \$21,545.42. Disbursements totaled \$14,761.95 with a current balance of \$6,783.47. The three N.S.F. grant accounts showed a total of \$25,210.52 for the January 1 balance plus receipts during 1962. Disbursements of N.S.F. funds totaled \$12,913.85 for a balance in N.S.F. accounts of \$12,296.67.

The complete financial report for the entire year of 1962 is as follows:

FINANCIAL REPORT OF THE INDIANA ACADEMY OF SCIENCE January 1, 1962 thru December 31, 1962

<i>Acct. No.</i>	<i>Account Name</i>	<i>Balance Jan. 1</i>	<i>Receipts Jan.-Dec.</i>	<i>Disbursed Jan.-Dec.</i>	<i>Balance Surplus</i>
1.	Indiana Academy of Science.....	1,417.02	4,486.15	2,504.39	3,398.78
2.	Jr. Academy of Science.....	141.19	—	109.03	32.16
3.	Academy funds designated for Research Grants.....	600.00	750.00	310.00	1,040.00
4.	John Shepard Wright Mem. Lib...	994.53	996.05	1,222.52	768.06
5.	Science Fair (1961 deficit)	-390.68	13,234.00	12,270.17	963.83
					<u>-390.68</u>
6.	Science Talent Search (1961 deficit)	-248.58	4,200.00	1,627.00	2,573.00
					<u>-248.58</u>
					<u>2,324.42</u>
A.	<i>Totals in State Accounts.....</i>	<u>2,513.48</u>	<u>23,666.20</u>	<u>18,043.11</u>	<u>8,136.57</u>
7.	NSF G-17042				
	Visiting Scientists Program.....	14,900.72	—	12,764.75	—
	Returned to Nat. Science Found...			2,135.97	
8.	NSF G-22464				
	Visiting Scientists Program.....	—	<u>17,150.00</u>	<u>4,583.42</u>	<u>12,566.58</u>
B.	<i>Totals in Federal Accounts.....</i>	<u>14,900.72</u>	<u>17,150.00</u>	<u>19,484.14</u>	<u>12,566.58</u>
A & B	<i>Total State and Federal.....</i>	<u>17,414.20</u>	<u>40,816.20</u>	<u>37,527.25</u>	<u>20,703.15</u>
	Bank Balances: First Federal Savings and Loan Assn.			10,150.00	
	Farmers State Bank			<u>10,553.15</u>	
					<u>20,703.15</u>

Audited March 7, 1963

Kermit H. Carlson, Treasurer

In our opinion these accounts are accurate and correct.

Auditing Committee: R. J. Hanson

Clarence Dineen

Editor—Richard A. Laubengayer: Volume 71 of the Proceedings will be ready for distribution shortly. The delay has been due to the publishing of the ten-year index. Twelve hundred hard bound copies and six hundred paper bound copies have been ordered from the printer. The editor urged that all contributors of manuscripts and abstracts follow the rules set down in the proceedings.

Program—Ralph Coleman: Everything is in good order for the Friday sessions. All members of the academy are invited to the social hour preceding the general session. A member of the Evansville College staff is to be in each divisional meeting and will be available for assistance as needed.

Press Secretary—Frank N. Young: Dr. Young reported that news releases had been sent out to the various news media and that the local newspapers and television and radio stations would cover the meetings. He pointed out that lack of some abstracts and delay in preparing the programs hampered news coverage.

Trustees of the Academy Foundation—William A. Daily: The beginning cash balance in the foundations funds plus receipts as of September 30, 1962 amounted to \$1,354.53. Disbursements were \$336.72, leaving a cash balance of \$1,017.81. As of September 30 the principal cash balance was \$619.84 but \$500.00 of this has been invested in a treasury bond. The total carrying value of bonds and stocks held by the foundation as of September 30, 1962 was \$14,563.92.

Relation of Academy to the State—William A. Daily: Mr. Daily reported that the committee had requested an increase of \$1,500.00 per annum for a total of \$5,500.00 requested per annum as a subsidy for publishing the Proceedings of the Academy.

In order to meet the additional expense of publishing the ten-year index in Volume 71 now at the printers a motion carried to authorize William A. Daily to seek the needed funds to pay the additional cost.

Research Grants Committee—T. J. Yuncker: Dr. Yuncker reported that \$460.00 had been allowed as follows during the past year:

Dr. C. L. Bieber, DePauw University, Dept. of Geology, \$100.00 for assistance in studying and mapping certain facies changes in the Mansfield Sandstone formation from Turkey Run to the Ohio River.

Mrs. Faye K. Daily, Dept. of Botany, Butler University, \$100.00 to aid in photographic and other work in her continuing study of fossil Charophytes.

Mr. Charles Hall, Manual Training High School, Indianapolis, \$100.00 to assist in expenses in his continuing survey of the algal flora of Putnam County, Indiana.

Prof. A. A. Smucker, Dept. of Chemistry, Goshen College, \$160.00 for the hire of an assistant used in connection with research on the physiology of fungi spore germination.

Biological Survey Committee—C. A. Markle: Reports have been submitted on work on flora and fauna of Indiana, indicating whether in progress, completed but not published, or published. The publications list and summary of work in progress follows:

Publications of 1961-1962

Dealing with the Flora and Fauna of Indiana

- Algae:**
1. Daily, Fay Kenoyer, 1961. Glacial and Post-Glacial Charophytes from New York and Indiana. *Butler Univ. Bot. Stud.*, Vol. XIV (1) : 39-71.
 2. Daily, William A., 1962. Some Algae of the Cabin Creek Raised Bog. *Proc. of Ind. Acad. of Sci.*, Vol. **71** in press.
 3. Hall, Charles R., 1962. Algae of Putnam County, Indiana. *Proc. of Ind. Acad. of Sci.*, Vol. **71** in press.
 4. Reimer, Charles W., 1962. Some Aspects of the Diatom Flora of Cabin Creek Raised Bog, Randolph County, Indiana. *Proc. of Ind. Acad. of Sci.*, Vol. **71** in press.
 5. Webster, Rex N., 1961. The Genus *Sphaerellopsis* in Indiana. *Butler Univ. Bot. Stud.* XIV (1) :7-8.
- Bryophyta:**
1. Welch, Winona H., 1962. The DePauw University Herbarium. *Proc. of Ind. Acad. of Sci.*, Vol. **71** in press.
 2. ———, 1962. The Hookeriaceae of the United States and Canada. *Bryologist* 65(1) : 1-24. Figs. 1-36.
 3. ———, 1962. The High Bridge Foray of the American Bryological Society. *Bryologist* 65(1) : 51-54.
 4. ———, Fontinalaceae. *North American Flora* in press.
- Vascular Plants:**
1. Jones, David T., 1962. History of Garden Day at Huntington College. Privately published (by the author). Floyd H. DeCamp Printing Co., Wabash, Indiana. 6 pp.
 2. Petty, R. O., and A. A. Lindsey, 1962. Hoot Woods, a Relic of Virgin Forest in Owen County, Indiana. *Proc. of Ind. Acad. of Sci.*, Vol. **71** in press.
- Annelida:**
1. Joyner, James J. and Paul Harmon, 1962. Investigations of the Burrows and Oscillative Behavior Therein of *Lumbricus terrestris*. *Proc. of Ind. Acad. of Sci.*, Vol. **71** in press.
- Insecta:**
1. Chandler, Leland, 1962. *Agapostemon nasotus* (Hymenoptera: Halictidae) in the United States. *Ann. Ent. Soc. Amer.* **55**(4) : 481.
 2. ———, 1961. Interspecific Competition in *Osmia lignaria* Say—*O. cordata* Robt. Nesting Associations. *Proc. North Central Branch, Ent. Soc. Amer.* **16**: 18-19.
 3. ———, 1961. Notes on the Species of *Psacnythia* (Hymenoptera: Andrenidae) in the Eastern United States. *J. Kansas Ent. Soc.* **35**(3) : 313-314.
 4. ———, 1962. The Nocturnal Bee, *Sphecodogastra texana* (Cr.), at Light Traps. *Proc. of Ind. Acad. of Sci.* Vol. **71** in press.
 5. Chandler, Leland and Rodney Kirkton, 1962. Preliminary Studies of Social Halictine Bees in a Bioclimatic Chamber. Symposium I Ent. Soc. Amer., Phoenix.
 6. Dishner, Gayla H. and Ray T. Everly, 1962. Greenhouse Studies on the Resistance of Corn and Barley to the Corn Leaf Aphid. *Proc. of Ind. Acad. of Sci.* Vol. **71** in press.

7. Dobson, R. C., 1962. Horn Fly Control on Beef Cattle by the Use of Cable Rubbers. Jour. of Economic Entomology in press.
8. Dobson, R. C. and D. A. Huber, 1961. Control of Face Flies (*Musca autumnalis*) on Beef Cattle in Indiana. Jour. Econ. Ent. Vol. 54(3): 434-436.
9. Everly, Ray T., 1961. Effect of Planting Date of Corn on Infestation and Damage by the Corn Earworm. Proc. North Cent. Br. E. S. A., Vol. XVI p. 36 Abst.
10. Ford, Benjamin T. and Ray T. Everly, 1962. Sorghum Resistance to the Corn Leaf Aphid, *Rhopalosiphum maidis* (Fitch). Proc. of Ind. Acad. of Sci. Vol. 71 in press.
11. Gould, George E., 1961. A Serious Corn Billbug Infestation. Proc. North Central Branch, Ent. Soc. Amer., 16: 34-35.
12. ———, 1961. Effectiveness of DDT for Cabbage Caterpillar Control in Indiana, 1945 to 1960. Jour. Econ. Ent. 54: 475-478.
13. Hershey, Stephen C. and Ray T. Everly, 1962. Effect of X-ray Radiation on the Survival of the Corn Leaf Aphid. Proc. of Ind. Acad. of Sci. Vol. 71 in press.
14. Matthew, D. L., Jr., 1961. Face Fly Overwintering in Indiana Homes. Proc. North Cent. Br. E.S.A. Vol. XVI, pp. 111-112.
15. Schuder, Donald L., 1961. *Euzophera ostricolorella* Hulst, a Root Collar Borer of Tulip Tree. Bul. Ind. Arborist Assn. June-July 1961. Proc. North Cent. Br. E.S.A. 1962 pp. 137-138.
16. ———, 1962. Insect Enemies of the Oaks. American Nurserymen CXV (10): 13 92-102.
17. ———, Scale Insects—Recent Developments in Their Control. Proc. 37th Nat'l. Shade Tree Conference, August 20-25, 1961: pp. 28-41.

Aves:

1. Mumford, Russell E. and Val Nolan, Jr., 1961. Albino Field Sparrow Found. Indiana Audubon Quarterly, 39:28.
2. Nolan, Val, Jr., 1962. Reproduction and Success of Birds in a Deciduous Scrub Habitat. Ecology, in press.
3. ———, 1962. The Sexual Nexus in the Prairie Warbler. Proceedings XIII International Ornithological Congress. In press.
4. ———, 1962. The Swaying Display of the Red-eyed and Other Vireos. The Condor 64: 273-276.
5. Nolan, Val, Jr. and Raymond Schneider, 1962. A Catbird Helper at a House Wren Nest. Wilson Bulletin 74: 183-184.
6. Nolan, Val, Jr. and David P. Wooldridge, 1962. Food Habits and Feeding Behavior of the White-eyed Vireo. Wilson Bulletin 74:68-73.

Mammalia:

1. Cope, James B., 1962. A Study of the *Myotis* of Wyandotte Cave, Crawford County, Indiana. Paper given at American Society of Mammalogists.

**Work in Progress or Completed, but not yet Published,
Dealing with the Flora and Fauna of Indiana**

Bryophyta:

1. Stevenson, Forrest. Building an Herbarium of Liverworts and Mosses.

2. Welch, Winona H. Bryophytes of Cabin Creek Raised Bog. Proceedings of Indiana Academy of Science, 1963.
 3. ———, Studies in Indiana Bryophytes XIII. Proceedings of Indiana Academy of Science, 1963.
- Vascular Plants :
1. Heiser, C. B., Jr. Pollination in *Magnolia*.
 2. Markle, Carrolle A. and Norman Richardson. Contributions to the Flora of Wayne County, Indiana.
- Annelida :
1. Joyner, James J. Earthworms of Indiana.
- Insecta and Arachnida :
1. Chandler, Leland. An Evaluation of the Community Ordination Method Using Winter Stonefly Populations. In progress, as Purdue AES Project No. 200 Sub. 12.
 2. ———, Interspecific Competition in *Osmia coerulea* (L.) *O. albiventrifera* Cr. Nesting Associations. North Central Branch, Ent. Soc. Amer., Purdue Univ. 1963.
 3. Chappell, Robert G. and L. Chandler. The Ecology of Winter Stoneflies in the Columbus, Indiana Area. Proc. Ind. Acad. Sci.
 4. Dobson, R. C. 1. Cattle Grub Control with Systemics.
 2. Cattle Grub Populations in Indiana.
 3. Face Fly Control Measures.
 4. Face Fly—Pink Eye Relationships.
 5. Horn Fly Reactions to Hormone Treated Calves.
 5. Everly, Ray T. 1. Control of Angoumois Grain Moth Field Investigation in Popcorn.
 2. Investigations of the Inheritance of Attractiveness of Dent Corn to the European Corn Borer Moths in Single, Tree-way, and Double-cross Dent Hybrids.
 3. Planting Date Effect on Insect Infestation and Damage in Dent Corn.
 6. Gould, George E. 1. Control of Corn Billbug, Wireworms and Other Soil Insects.
 2. Control of Cucumber Beetles.
 3. Control of Insects Attacking Peppermint and Spearmint.
 4. Japanese Beetle, Its Potential Danger to Agricultural Crops in Indiana.
 7. Hardwick, Paul F. and L. Chandler. The Mortality of *Ceratina metallica* Smith during Hibernation.
 8. Hazeltine, William E. and L. Chandler. A Preliminary Atlas for the Identification of Female Bumblebees, Based on the Sixth Metasomal Sternite.
 9. Hershey, Stephen C. and Ray T. Everly. Effect of Stage of Corn Plant Development in the Greenhouse on Survival of the Corn Leaf Aphid. To be presented at the 1962 meeting of the North Central Br. of the Ent. Soc. Amer. in Minneapolis.
 10. Schuder, Donald L. 1. Control of the Leafroller *Tortrix pallorana* Rob. on Pine Trees.
 2. The Ecology and Control of the Mimosa Webworms *Homadaula albizziae* Grote, in Indiana.
 3. The Biology and Control of Scale Insects on Ornamental Trees, Shrubs and Vines.
 4. The Biology and Control of Borers of Woody Ornamentals.
 5. Biology and Control of the Zimmerman Pine Moth, *Dorycteria zimmermani* Grote.

6. Biology and Control of Mites on Woody Ornaments.
 11. Siverly, R. E. Taxonomic and Distributional Study of Mosquitoes in Indiana.
 12. Ward, Gertrude L. 1. Insects of the Whitewater Valley. 2. Spiders of Indiana.
 13. Wood, Vida G. The Effect of X-Radiation of Longevity in *Drosophila melanogaster*. In progress, AEC Grant.
- Aves:
1. Cooper, Robert H. Occurrence of the Whistling Swan (*Cygnus columbianus* L.) in Delaware County, Indiana. To be given at the Indiana Academy of Science Autumn Meeting, 1962.
 2. Cope, James B. Bird Migration Studies.
 3. Nolan, Val, Jr. Long Term Monographic Studies of Prairie Warbler, White-eyed Vireo, Bell's Vireo, Cardinal, Indigo Bunting, Slate-colored Junco, Goldfinch—All from Banded Populations, Bloomington.
- Mammalia:
1. Cope, James B. Bats of Indiana.
- Miscellaneous
1. Laubengayer, Richard A. Inventory of Plant Groups in Allee Memorial Woods, Parke County, Indiana.
 2. Williams, Eliot C., Jr. Quantitative and Population Studies of Certain Insect, Reptile, Mammal and other Faunal Groups in Allee Memorial Woods, Parke County, Indiana.
- Plant and Animal Group:

Fellows Committee—Ray T. Everly: The following names were presented as recommendations for election as fellows of the Academy: Marion T. Hall, Botany and Plant Taxonomy; V. J. Shiner, Jr., Chemistry; Marvin Carmack, Chemistry; E. V. Walter, Entomology; Harold Morrison, Entomology; George D. Lovell, Psychology; James P. Egan, Psychology; John F. Pelton, Plant Taxonomy; A. J. Ohlrogge, Soil Science; Stanley A. Barber, Soil Science.

A motion carried to recommend the names submitted by the committee to the assembly of the Academy for election as fellows.

The committee also made a number of suggestions to enhance the status of Fellow in the Academy. They reported that the certificate of election had been prepared and recommended that they be issued to fellows elected previous to 1962. A number of other suggestions are to be incorporated in proposed constitutional changes. The committee reported was accepted.

Invitations Committee—R. E. Siverly: The chairman reported that the invitation of Goshen College to hold the fall meetings in 1963 at Goshen College had been accepted. He reported that Wabash College had indicated interest in hosting the 1964 meeting and that Ball State College may be in a position to host the 1965 meetings.

Library Committee—Mrs. Lois Burton: Mrs. Burton presented the report of the library committee. Throughout the year special attention has been given to the acquisition of missing issues of publications, a program which has had a gratifying response, perhaps indicating better circumstances among the foreign agencies with which the Wright Library

corresponds. Exchange arrangements were made with additional organizations and twenty-three new titles have been received. Two hundred nineteen volumes of serial material were prepared for binding as directed by the Academy's Budget Committee at a cost of \$996.05. Copies of the checklist of the Library's *Titles and Holdings of Periodical Literature*, prepared in 1959 but still reasonably useful were distributed at the latest Junior Scientists Assembly at Indianapolis. The following items were purchased with Lilly Endowment Inc. funds: International Association of Physical Oceanography. Publications Scientifique, nos. 14-20; Cabot Foundation. Publications nos. 4-5; India. Dept. of Agriculture. Memoirs. Botanical series. v. 1-19, 1906-1913. At the suggestion of Mrs. John Shepard Wright several handsomely illustrated volumes on birds of various countries are on order to be charged to the Wright Fund.

Representative to the AAAS Council—Willis Johnson: Our representative reported that he had attended the meetings of the council last Dec. 27 and 30. No business pertaining especially to the State Academies was considered but a summary report of the highlights of the council sessions were presented to the executive committee.

Youth Activities Committee—Paul Klinge: The chairman reported on the activities of the various groups, the scope and importance of the youth activities in the Academy and the status of the work in Indiana as compared to other states. He reported that the incorporation of the activities sponsored by this committee into the State Academy program was being used as a model by other state groups. He pointed up the need for proper identification and recognition of the youth activities by the Academy as important in securing needed support for the programs.

Science Fairs—In the absence of Leslie Willig who served as State Director, Paul Klinge reported on the scope of the 1962 activities. There were twelve regional fairs in Indiana and the director arranged details for transporting 24 student winners and their sponsors to Seattle for the National Science Fair. The total cost for the fair program was \$12,270.17, much of which Dr. Willig raised himself.

Junior Academy—Howard Michaud: Dr. Michaud reported that approximately 230 students, sponsors and guests attended the 1961 meeting at Indiana State College. Sixteen exhibits and 24 papers were presented. Stephen Ridgway of Central Jr.-Sr. High School, South Bend received the best boy award and Patricia Kira of George Washington High School, Indianapolis, and Margaret Weir of John Adams High School, South Bend tied for the best girl award. Rosemary de Beeze, Immaculate Conception Academy, Oldenburg, won the bacteriology award. The 1962 meeting will be held in Evansville on October 20.

Visiting Scientists Program—Howard Michaud: As director of the program Dr. Michaud reported that 88 scientists from 20 Indiana colleges and universities made 238 visits. The number of visits by special areas were: biology, 79; chemistry, 47; physics, 41; mathematics, 37; entomology, 12; geology and geography, 12; bacteriology, 4; bionucleonics,

3; astronomy, 2; general science, 1. A total of \$2,534.50 in grants from \$2.97 to a maximum of \$100.00 was made to 54 students for projects.

Science Talent Search—Sears Crowell: As chairman of the committee, Dr. Crowell reported on the results of the Science Talent Search in Indiana. Indiana has ranked very high in national competition. The Tri Kappas have assumed full responsibility for the support of the program.

Indiana School and College Committee on Mathematics—J. C. Polley: Dr. Polley reported that the committee promoted activities intended to stimulate interest in the improvement of the mathematics program in schools and colleges in Indiana. It supported local meetings of mathematics teachers held at various centers during the year and a special program devoted to a discussion of geometry in the school mathematics curriculum and in the undergraduate mathematics program. The committee also collaborated with a committee of Indiana actuaries representing the Society of Actuaries in managing the National Mathematics Contest for high schools in Indiana. Plaques were presented to the highest ranking high schools and individual prizes were awarded to the top 25 individuals. The National Science Foundation has granted the amount of \$4,000.00 to support the program of the committee for the academic year 1962-63.

It was announced that William Kessell of Indiana State College would serve as director of the Visiting Scientists Program in place of Dr. Howard H. Michaud, who asked to be relieved of this duty.

Dr. Ray Everly offered the following motion which carried: Because of these deficiencies in the present constitution and by-laws, a special committee of three members be appointed by the incoming president for 1963 to redraft these documents and submit the new constitution to the Executive Committee for consideration at the fall meeting of 1963.

The following constitutional and by-laws changes were presented for consideration:

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 Chairman, a Secretary, a Membership Secretary, a Treasurer, an Editor and a Press Secretary."

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 lists 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 divisional representatives shall be replaced when their terms expire with others elected 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 give advice and assistance in the preparation of proposed amendments. The committee shall consist of three members in rotating order, each serving as chairman the last year of his term. The chairman of the committee shall be a member ex-officio of the Council of the Academy.

It was moved and carried that the proposed changes in the constitution be distributed in the spring mailing prior to the spring meeting.

Thirty-one members of the executive committee were in attendance.

The meeting adjourned at 11:00 P. M., C.D.T.

WILLIAM W. BLOOM, Secretary

Approved 10-19-62

MINUTES OF THE GENERAL SESSION

EVANSVILLE COLLEGE, October 19, 1962

The general session was called to order by President Harry G. Day who then introduced Dr. Melvin Hyde, President of Evansville College, who welcomed the members of the Academy to Evansville and to the campus.

The minutes of the Executive Committee were read and approved.

The proposed amendments to the constitution and by-laws of the Academy which had been approved in the Executive Committee meeting were reread as published in the record of the Executive Committee meeting and approved by the assembly. These amendments will be read for the second time at the general sessions of the Spring meeting in 1963 for final adoption.

Dr. William E. Edington presented a short biographical sketch of members who had died during the year, the sketches published in another section of the Proceedings. The deceased members were John Orville Cottingham, Jesse James Galloway, Waldo Lee McAtee, Robert John Sheehan, Jesse Robertson Singleton, Paris Buell Stockdale, Richard Lockwood Webb, Charles Alexander Deppe, and G. Wyatt H. Powell.

Dr. Richard T. Arnold, president, Mead Johnson Research Center, and formerly chairman of the Department of Chemistry, University of Minnesota, presented a most stimulating address on "The Everlasting Fight Against Professional Obsolescence."

The meeting was adjourned for the beginning of the sectional meetings.

The sectional meetings began at 11:00 A. M. and continued until completion of the divisional programs with a noon recess for lunch. Following completion of the divisional programs an open house was held at the Angel Mounds Site with a tour of the area conducted by Dr. Glenn A. Black.

The annual dinner meeting was held in the Great Hall of the Student Union Building of Evansville College.

Vice President Howard H. Michaud presided at the meeting and introduced the officers at the speaker's table. Visitors from New Jersey, Illinois, and New Zealand were introduced to the assembly.

Dr. Ralph E. Cleland, reporting for the nominations committee, announced the divisional elections held during the sectional meetings. The chairman elected for the 1963 meetings were: Anthropology, Richard Johnson, Indiana Historical Society, Evansville; Bacteriology, Richard Smith, Miles Ames Research Laboratory, Elkhart; Botany, J. H. May-silles, Hanover College; Chemistry, Keith White, Hanover College; Entomology, George E. Marshall, Experimental Horticultural Orchard, Mitchell; Geology and Geography, Robert Johnson, Purdue University; History of Science, A. T. Guard, Purdue University; 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, William Eberly, Manchester College.

A slate of officers was presented, followed by a motion to close the nominations and to elect the slate by acclamation. The motion carried and the officers elected for 1963 are as follows: President, Howard H. Michaud, Purdue University; Vice President, Edward Haenisch, Wabash College; Secretary, William W. Bloom, Valparaiso University; Treasurer, Kermit H. Carlson, Valparaiso University; Editor, Richard A. Laubengayer, Wabash College; Press Secretary, Frank N. Young, Indiana University; Committee of Bonding Trustees, Scott McCoy, Technical High School, Indianapolis; Frank J. Welcher, Indiana University, Adult Education Center, Indianapolis; Research Grants Committee, John Fraser Hart, Indiana University.

Howard R. Youse, Chairman of the Resolutions Committee presented the following resolutions which were approved:

Resolved: That the Academy members here assembled express their sincere thanks to Evansville College through Dr. Melvin W. Hyde, President of the College for all the courtesies which have been shown the Academy during the meetings. Special appreciation and thanks are due to Professor R. H. Coleman and his committee in charge of the program and local arrangements for the splendid and efficient manner in which all arrangements were made for the conduction of the business of the Academy and the comfort and convenience of the entire membership.

Resolved: That the Academy members here assembled express their sincere appreciation to Howard H. Michaud, who has been sponsor of the Indiana Junior Academy of Science for the past sixteen years and chairman of the Visiting Scientists program of the Academy for the past four years, in which capacity he has given outstanding leadership in science education in the State of Indiana.

Special appreciation and thanks are also due Ralph Lefler for his twelve years of service as chairman of the Science Talent Search. Through his efforts and leadership many young scientists have received recognition and scholarships that have enabled them to continue their science training and to take their place in our science community.

In the absence of Dr. Louis DeLanney, Dr. Willis Johnson reported for the membership committee. He reported that a tentative list of thirty-seven full members, twenty student members and two Junior clubs had applied for membership. The applications were approved.

Dr. Michaud called attention to the meetings of the Junior Academy on Saturday and urged every member to attend some of the meetings if possible.

The formal business meeting was adjourned and Dr. Michaud introduced President Harry G. Day who presented his presidential address on "The Nutritional Significance of Trace Inorganic Elements." The text of the address is published as a part of the Proceedings.

WILLIAM W. BLOOM, Secretary

NEW MEMBERS—1962

Adler, Edwin F., 301 Winfield St., Greenfield, Ind.	Bo
Ahrendt, Mrs. Martha, 1331 N. Chester St., Indianapolis 1, Ind.	G
Akalan, Dr. Ilahn, Ziraat, Fakultesi Toprak Kursusu, Ankara, Turkey	SS
Alexander, Archie, R. R. 7, Crawfordsville, Ind.	E
Amstutz, David W., Walnut Grove Trl. Ct. No. 94, Bloomington, Ind.	G
Amstutz, Frank E., R. R. 1, Spencerville, Ind.	G
Annis, Mr. James Frederick, 200 E. Southern Dr., Bloomington, Ind.	A
Arnold, Dr. Richard T., Mead Johnson Research Center, Evansville, Ind.	C
Aughenbaugh, Nolan B., R. R. 10, Lafayette, Ind.	
Baiamonte, Vernon D., 906 Clarksdale Dr., Muncie, Ind.	C
Bart, Miss Carol, 508½ N. Lincoln Ave., Bloomington, Ind.	A
Bast, Mr. Leonard J., Jr., Redbud Hill Apts., No. 603, Bloomington, Ind.	A
Bedwell, Max, 206 E. Mulberry St., Salem, Ind.	Z, Bo
Benjaminov, Benjamin, Rose Polytechnic Institute, Terre Haute, Ind.	C
Billman, D. C., Jr., Mgr. of Quality Control, Chas. Pfizer Co., Vigo Plant, Terre Haute, Ind.	C
Blair, Dr. Byron O., Agronomy Dept., Purdue Univ., Lafayette, Ind.	G, SS
Bosstick, Maurice, 1917 N. 13th St., Terre Haute, Ind.	Z
Brown, M. Alan, Franklin College, Franklin, Ind.	C
Carney, Thomas P., 740 S. Alabama St., Indianapolis, Ind.	C
Cleveland, John Herbert, 2201 E. 7th, Bloomington, Ind.	G
Craig, Prof. Edwin Charles, Physics Dept., Ball St. College, Muncie, Ind.	Ph
Cropp, Mr. C. Bruce, 11313 Old State Rd., Evansville, Ind.	Ba
Davis, Mr. John Baldwin, 1419 Potomac Ave., Lafayette, Ind.	E
Decker, Mr. Johnathan E., 507 Ringo Drive, Brazil, Ind.	G
Dobbins, Mr. David R., 798 E. Jefferson St., Franklin, Ind.	Bo, Z
Feldman, Dr. Herman, Indiana Univ., Gary campus, 3400 Broadway, Gary, Ind.	Ps
Forbes, Mrs. Olive E., 132 First Ave., Oakland City, Ind.	C
Gabbard, Miss Karen Lee, 2635 N. 11th St., Terre Haute, Ind.	Ba
Garnier, Prof. Benjamin J., Dept. of Geography, I. U., Bloomington, Ind.	G
Ghate, Mr. Ashok V., Dept. of Entomology, Agric. Hall, Purdue Univ., Lafayette, Ind.	E
Haffley, Mr. Philip G., 2706 Milton Dr., Bloomington, Ind.	C
Hall, Mr. Donald W., 102 Andrew Place, W. Lafayette, Ind.	E

Hamon, Dr. J. Hill, Dept. of Zoology, Indiana State College, Terre Haute, Ind.	Z
Hardwick, Mr. Paul F., R. R. 4, Bedford, Ind.	E
Harris, Franklin, 205 Morris Hall, Wabash College, Crawfordsville, Ind.	Bo
Harrison, Mr. Edward F., 1650 E. Walnut St., Evansville, Ind.	Ba
Haslanger, Martin W. (Mrs.) 20980 New Rd., Lakeville, Ind.	Bo, G
Hatchett, Mr. Jimmy H., A.E.S. Bldg., Ento. Res. Div., Purdue Univ., Lafayette, Ind.	E
Heniser, Mr. Virgil, 121 Jordan Hall, Indiana Univ., Bloomington, Ind.	C
Hicks, Dr. R. Lowell, Science Dept., Arlington H. S., 4825 N. Arlington, Indianapolis 26, Ind.	C
Hoffman, Warren E., Chem. Dept., Indiana Technical College, Fort Wayne, Ind.	C
Hufford, Terry L., 3920 S. Meridian St., Apt. 15, Indianapolis, Ind.	Bo
Hull, Dr. Clarence, Science Dept., Indiana State College, Terre Haute, Ind.	C
Hunt, Mr. Ariel C., Foreman, Yards and Grounds, R. R. 7, Schaffer Rd., Evansville, Ind.	Bo, E, SS
Johnson, Charles B., R. R. 2, Otterbein, Ind.	SS
Johnson, Dr. Robert B., School of Civil Engineering, Purdue Univ., Lafayette, Ind.	G
Kane, Henry Edward, Dept. of Science, Ball St. Teachers College, Muncie, Ind.	G
Knowles, William W., Geography Dept., I. U., Bloomington, Ind.	G
Kohlstaedt, Dr. Kenneth G., M. D., Executive Director Med. Research, % Eli Lilly Co., 740 S. Alabama St., Indianapolis 6, Ind.	
Kowitz, William T., Geog. Dept., Valparaiso Univ., Valparaiso, Ind.	G
Kutlich, Eleanor Svea, 9601 Petersburg Rd., Evansville 7, Ind.	Bo
Lantz, Mr. Larry, 1118 E. State St., Ft. Wayne 3, Ind.	Bo, PT
Larsen, Dr. Aubrey A., Mead Johnson Research Center, Evansville, Ind.	C
Mann, Dr. Robert L., Lilly Research Labs., Eli Lilly and Co., Indianapolis, Ind.	C
Mannering, Jerry V., Lilly Hall of Science-Agronomy Dept., Purdue Univ., Lafayette, Ind.	SS
Martin, William E., Head, Dept. Child Development, Purdue Univ., Lafayette, Ind.	Ps
McElhinney, Mrs. Margaret, 3816 Brook Dr., Muncie, Ind.	Bo
Meisenheimer, Mr. John L., Chemistry Dept., Indiana Univ., Bloomington, Ind.	C
Moussa, Dr. Mouflid A., 613 State Office Bldg., Division of Entomology, Indianapolis 9, Ind.	E

Mueller, Wayne P., Evansville College, Evansville 14, Ind.	Z
Murray, Mr. Harry L., Mead Johnson and Co., Evansville, Ind.	Ba
Neumann, Mr. Erik Arnulf, 704 S. Rose Ave., Bloomington, Ind.	A
Olson, Mr. Tamlin C., 2501 Iroquois Tr., Lafayette, Ind.	SS
Pemberton, Woodrow, 844 Jackson Ave., Evansville 13, Ind.	Ph
Post, Mr. Donald F., Agronomy Dept., Purdue Univ., Lafayette, Ind.	SS
Powell, Mr. Richard L., 417 E. Allen St., Bloomington, Ind.	G
Prickett, Dr. Paul S., Mead Johnson and Co., Evansville, Ind.	Ba
Redfern, Mr. Robert E., Sr., 1118 Chestnut St., Vincennes, Ind.	E
Reed, Walter L. and Esther B., 500 Barton Ave., Terre Haute, Ind.	G
Ritter, Mr. David L., 2861 Harts Run Rd., Allison Park, Penn.	Z
Robinson, Prof. Kenneth S., Oakland City College, Oakland City, Ind.	Ph
Rothwell, Frederick M., 104 S. 17th St., Terre Haute, Ind.	Bo
Sapaula, Miss Crispina C., 346 S. Grant St., Bloomington, Ind.	A
Siders, Miss Marlyn, R. R. 2, Macy, Ind.	Z, Bo
Skomp, Mr. David C., 1123 Euclid Ave., Marion, Ind.	A
Smith, Mr. Jerry D., Box 136, Roachdale, Ind.	Z
Sparks, Phillip D., R. R. 3, Terre Haute, Ind.	Bo
Sutton, Traver C., Physics Dept., Evansville College, Evansville, Ind.	Ph
Tamar, Dr. Henry, Division of Science, Indiana State College, Terre Haute, Ind.	Z
Terman, Dr. C. Richard, Biology Dept., Taylor Univ., Upland, Ind.	Z
Tweedell, Dr. Kenyon S., Dept. of Biology, Univ. of Notre Dame, Notre Dame, Ind.	Z
Wade, Claude F., 210½ Main, Whiteland, Ind.	E
Waller, Dr. Coy W., Mead Johnson and Co., Evansville, Ind.	C
Welder, Dr. George W., Ball State Teachers College, Muncie, Ind.	Ba, Z
Wertenberger, Dr. Grace E., Physiology Dept., Indiana Univ., Bloomington, Ind.	
Wheaton, Prof. Howell N., Agron. Dept., Life Science Bldg., Purdue Univ., W. Lafayette, Ind.	SS
Whitaker, Dr. John O., Jr., Dept. of Science, Indiana State College, Terre Haute, Ind.	Z
Zachary, Mr. Alvin L., Agronomy Dept., Life Science Bldg., Purdue Univ., Lafayette, Ind.	SS
Zehring, Miss Conie Sue, R. R. 1, Bunker Hill, Ind.	E

JUNIOR ACADEMY CLUBS

- Fulton Jr. High School Science Club, 10th and Girl School Road, Indianapolis, Ind.
- Manuel High School Saturday Morning Science Club, Emmerich Manuel High School, 2405 Madison Ave., Indianapolis 25, Ind.

INDIANA JUNIOR ACADEMY OF SCIENCE

OFFICERS FOR 1962

President: Craig Johnson, Washington High School, Indianapolis
Vice President: Janet Holscher, Saint Rose Academy, Vincennes
Secretary: Kathryn Crider, North Central High School, Indianapolis

MEMBERS OF THE COUNCIL

Robert Weber, Chairman, Fort Wayne (1958-1962); Sister Suzanne, Vincennes (1959-1963); V. C. Cripe, South Bend (1960-1964); Don R. Winslow, Bloomington (1961-1965); Helen Reed, Lebanon (1962-1966).

PROGRAM OF THE THIRTIETH ANNUAL MEETING

OCTOBER 20, 1962

Engineering Science Building, Evansville College, Evansville, Indiana.
8:30-10:00 A. M. Registration and Placement of Exhibits, Room 203.
10:00-11:00 A. M. Conferences in Science and Mathematics by faculty representatives of Evansville College.



Officers of the Junior Academy: l. to r., Vice-President, Janet Holscher, Saint Rose Academy, Vincennes; President, Craig Johnson, Washington High School, Indianapolis; Secretary, Kathryn Crider, North Central High School, Indianapolis.

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

12:00 Noon Luncheon, Cafeteria, Union Building.

1:15 P. M. General Assembly, Great Hall, Union Building, Craig Johnson, presiding.

Greetings, Dr. Nicholas Brown, Dean of Evansville College.
Business Meeting, Election of Officers and Presentation of Awards.

1:30-2:45 P. M. Program of Papers, President, Craig Johnson, presiding.

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

1. Investigations With a Home Heart Monitor, Frank Steiner, JETS, Central Junior-Senior High School, South Bend.
2. The Culture of Albino Maize, Marcia Lawlis, MSE Academy, University High School, Bloomington.
3. Synthesis of Amino Acids and Peptide Linkages Under Primitive Earth Conditions, Robert R. Batton, III, A. J. Kent High School, Kentland.
4. The Attitudes of School Children Toward Fallout, Valerie Savage, MSC Academy, University High School, Bloomington.
5. Thyroid Gland Studies (illustrated), Mal Stephens, Science Club, New Albany High School, New Albany.
6. The Comparative Study of the Effect of Propylthiouracil and Thyroid Substances on Metamorphosis in the Bullfrog, Kathryn Crider, North Central High School, Indianapolis.
7. Scientific Detection of Oil Painting Forgeries, Amy Suer, Gross Academy of Science, University High School, Bloomington.
8. Data Retrieval by Use of Magnetic Tape, Dennis Henry, Up-N-Atom Science Club, Crawfordsville High School, Crawfordsville.
9. Drosophila Chromosome Studies (illustrated), Danny Ware, Science Club, New Albany High School, New Albany.
10. Biochemistry and Genetics of Certain Bacteria, Irene Cuffey, Gross Academy of Science, University High School, Bloomington.
11. Internal Parasites in Mice and Men, Vicki Schmidt, Sigma Mu, Franklin Central High School, Acton.
12. Embryonic Heart Development of the Chick, Richard Wettrick, North Vernon Junior-Senior High School, North Vernon.
13. The Effect of Lysozyme on Certain Bacteria, Reba Koch, Science Club, Washington High School, Indianapolis.
14. Primary Investigation of Thymectomization on *Mus Norwegicus Albinus*; with Proposed Secondary Investigation on the Effect of Thymectomization on Resistance to Bacterial Infestations, Greg Lumbra, Gross Academy of Science, University High School, Bloomington.
15. Producing and Testing Penicillin, Janet Holscher, Sigma Tau, St. Rose Academy, Vincennes.
16. Effect of Temperature on Enzyme Induction in *Escherichia Coli*, Steve Barclay, Sigma Mu, Franklin Central High School, Acton.

17. An Experiment in Tissue Culture, Susie Talbott, Gross Academy of Science, University High School, Bloomington.
18. The Mathematical Relationship of the Four-Bar Linkage (illustrated), Gordon Clark, Science Club, Washington High School, Indianapolis.
19. An Investigation of an Electrical Interaction of Amino Acids and Enzymes, William J. Francis, Future Scientists of America, Garfield High School, Terre Haute.
20. A Living Fuel Cell, Craig Johnson, Science Club, Washington High School, Indianapolis.
21. The Transfer of P³² Through a Food Chain, Jane Richardville, Sigma Tau, Saint Rose Academy, Vincennes.
22. The Construction and Use of the "Durrum Type Electrophoresis Cell" in the Study of Blood Protein, Tony Rice, Rex Mundi High School, Evansville.
23. Genetics of the Fantail Pigeon, Sherman Wolfe, Science Club, Washington High School, Indianapolis.
24. Amino Acid Composition of Ice Age and Modern Snail, Carl Bose, Science Club, Westlane Junior High School, Indianapolis.
25. The Position of Static Charges, Michael Wright, Science Club, Westlane Junior High School, Indianapolis.
26. Column and Paper Chromatography, Lynn Ann Knabel, Memorial Chapter, J.A.S., Reitz Memorial High School, Evansville.
27. The Production of Cancer in Chicks, Cecilia Grannan, Memorial Chapter J.A.S., Reitz Memorial High School, Evansville.

Minutes of Indiana Junior Academy of Science

The thirtieth annual meeting of the Indiana Junior Academy of Science was held Saturday, October 20, 1962 in the Engineering Science Building and in Great Hall of the Union Building of Evansville College, Evansville, Indiana.

Seven exhibits of science projects by high school students were displayed in Room 203, Engineering Science Building. The exhibits included the following: "The Effect of Lysozymes on Bacteria"; "Thyroid Gland Studies"; "A Living Fuel Cell"; "Gas Chromatography"; "Cancer in Chicks"; "Internal Parasites in Mice and Men"; and "The Comparative Study of Propylthiouracil and Thyroid Hormones on Metamorphosis in the Bullfrog."

Conferences in science and mathematics were held at 10:00 a.m. by members of the faculty of Evansville College. The science areas represented were: Chemistry; Botany; Geography and Geology; Medicine and Related Fields; Physics; and Zoology. Mathematics, Engineering and Psychology completed the list of conferences. Visits to the instructional and laboratory facilities were made between 11:00 a.m. and 12:00 Noon. Members of the Junior Academy greatly appreciated the cooperation of the science faculty and student assistants who conducted the tours.

The afternoon session was held in Great Hall of the Union Building. The meeting began at 1:15 p.m. with remarks by the president, Craig

D. Johnson, who introduced Dr. Nicholas Brown, Dean of Evansville College.

Dean Brown welcomed the Indiana Junior Academy of Science members and their sponsors and extended the greetings of the faculty. He addressed the group briefly and emphasized that all should enroll in the social sciences and humanities as well as science. He stressed the fact that science has the power of good and evil and that it is man's responsibility to think in terms of social implications of the sciences. He said that "what to do and get is knowledge; what to be and become is know-why." It is education versus training; the difference is one of responsibility.

Mr. Edward Hudson, Kroger Grocery Company, Evansville, was called upon to present the annual Kroger Awards. The first place award of \$50 and a plaque was presented to Tecumseh Junior High School, Lafayette. Mr. David Cole accepted the award for the school. Two runner-up awards of \$25 and a plaque were presented to Alquina High School, Connorsville, and Lawrence Central High School, Indianapolis. Mr. Walter Gronning, Science Teacher, accepted the award for Alquina, and Lawrence Central received the award in absentia. Kroger awards are presented annually to the three top-ranking high schools for outstanding school science programs judged from self-evaluating questionnaires sent to all high schools in Indiana.

The first item of business was the election of officers. Each club had received a ballot on which the nominees and their qualifications were listed. The club is entitled to one vote for each of the officers. The ballots were marked and returned to the Council or delivered by a representative of the club at the business meeting. The results of the election of officers for 1963 were as follows: President, Kathryn Crider, North Central High School, Indianapolis; Vice-President, John Gaiser, University School, Bloomington; and Vicki Schmidt, Franklin Central High School, Acton, Secretary.

The president then introduced the members of the Council, Mr. Robert Weber who was not present, Sister Suzanne, Mr. Donald Winslow, Mr. V. C. Cripe, and Miss Helen Reed. He announced that Mr. Erwin Steinkamp of New Albany was named the new Council member to replace Mr. Robert Weber, Fort Wayne, whose term expired this year.

The award for "best boy" in science was received by Frank Steiner of Central Junior-Senior High School, South Bend, and Craig Johnson of Washington High School, Indianapolis. Two girls shared the "best girl" award in science. They were Irene Cuffey, University High School, Bloomington, and Janet Holscher, Saint Rose Academy, Vincennes. A certificate of merit and a year's membership in the American Association for the Advancement of Science were presented to each of the above students. Dennis Henry, Crawfordsville High School, Crawfordsville, and Kathryn Crider, North Central High School, Indianapolis, received honorable mention and each was given a certificate of merit.

Dr. Walter A. Zygmunt, Mead-Johnson Laboratories, representing the American Society of Microbiologists, was introduced by the president. He announced that no project or paper warranted the monetary award,

Craig Johnson and Reba Koch of Washington High School, Indianapolis. Certificates of honorable mention for papers were awarded to Irene Cuffey, University School, Bloomington; Janet Holscher, St. Rose Academy, Vincennes; Steve Barclay, Franklin Central, Acton, and Susie Talbott, University School, Bloomington.

The thirtieth annual meeting of the Indiana Junior Academy of Science was attended by 245 registered members, sponsors, and guests. A total of 23 schools were represented with 20 club sponsors present from 13 schools.

Twenty-six papers as listed on the program were read at the afternoon meeting. A brief review of each paper follows:

"Investigations With A Home Heart Monitor" was presented by Frank Steiner, Central Junior-Senior High School, South Bend. He found that by using a saline solution and bicarbonate of soda and an electrode set-up, he could detect pulse rates and heart murmurs. The electrodes were placed on the chest over the heart and on the ankle and the impulses in the body were recorded in seven and one-half seconds. Frank explained that the transmission of the impulses occurred in the same manner as messages over a telephone line. He suggested that a heart monitor could be useful in hospitals because it could reveal in a few seconds if the patient had had a heart attack or was a victim of rheumatic fever.

Marcia Lawlis of University High School, Bloomington, read her paper, "The Culture of Albino Maize." In her experiment she used three methods of study. One series of albino corn plants were fed a 0.3 molar sucrose solution through the leaf tip, roots, and stems. The plant which was fed through the leaf tip died in one week. A green one which she used lived from Jan. 27 to May 15. Two albino plants and two green plants were fed through the roots. One set was fed tap water, a second one was fed sucrose. After three days, the albino plant died, and the green plant in the sucrose solution was wilted. The stem feeding method involved two albino plants. One received sucrose, the second one tap water. The albino plants were kept alive as long as possible, but the plants did not form tassels. She concluded that the albino plants could be kept alive by artificial feedings.

"The Synthesis of Amino Acids and Peptide Linkages Under Primitive Earth Conditions" was read by Robert R. Batton, III of A. J. Kent High School, Kentland. He used paper gas chromatography to identify the amino acids. He stated that the acids were all organic and that identification of the acids has been possible and that research would increase the efficiency of the identification.

In her paper, "The Attitudes of School Children Toward Fallout," Valerie Savage of University High School, said that she had tested boys and girls in the fifth, sixth, and seventh grades. She found that the students had no psychological barriers to the questions asked. In answering some of the questions, seventy percent of the children agreed that they should not eat snow because it may be radioactive. Three fifths of the children agreed that each new school should have a fallout shelter. They also agreed that family fallout shelters should admit other people, but that pets should be allowed instead of the other people.

"Thyroid Gland Studies" was the paper read by Mal Stephens, New Albany. He showed several interesting slides of his laboratory at home and told how important it was to do the bookwork and to have the equipment. He used white rats and thyroxine, a hormone containing iodine. His primary research involved the recording of the basal metabolism in the treated and control rats. He found that there is a direct relationship between the thyroid level and basal metabolism.

Kathryn Crider, North Central High School, Indianapolis, also did a study involving thyroid hormones. In her paper, "The Comparative Study of Propylthiouracil and Thyroid Hormones on the Metamorphosis of the Bullfrog," she explained that the hormones and propylthiouracil were introduced into the aquaria containing individual tadpoles. She found that metamorphosis was initiated in four days in the tadpole being treated with triiodothyronine, in ten days in the tadpole treated with thyroxine, and none occurred in the one being treated with propylthiouracil. The control tadpole began its metamorphosis in four weeks. She concluded that thyroxine is not as effective as triiodo-thyronine in inducing a precocious metamorphosis, and that propylthiouracil inhibits the activity of the thyroid gland, thus retarding metamorphosis.

An interesting paper, "Scientific Detection of Oil Painting Forgeries," was read by Amy Suer, University High School, Bloomington. She said that there was no outlined procedure to follow in determining if a painting was a forgery. She indicated that there were several ways to detect a forgery, one was by smell, another was an examination of the brush strokes, the intensity of the color and the tones. She also said that X-ray and ultraviolet light could be used to identify forgeries in the paintings. Frequently the age of the paper can give the clue to a forgery.

Dennis Henry of Crawfordsville High School, Crawfordsville, reported on his research on the data retrieval unit which he built. In his paper, "Data Retrieval by Use of Magnetic Tape," he explained the apparatus which he had built. He explained that the deck in his apparatus was converted to solenoid operation so that it could be connected directly to the retrieval circuits. He used one solenoid each to control the following directions: forward, reverse (rewind), play/record (run), and stop. He could control the movements either manually or by the control deck, or electrically by lever switches on the front panel. Dennis felt that his deck gave a good performance and is probably the only one he could have converted to solenoid operation.

Danny Ware, New Albany High School, New Albany, used illustrations to explain his paper, "*Drosophila* Chromosome Studies." Danny said that one of the difficulties encountered was in the preparation of slides for comparison with known chromosome maps of *Drosophila*. He was able to develop a technique for slide preparation, and because of the reproduction rate in his test organism, he had chromosome material available at all times. The second step of his project involved the study of mutations and gene loci, and finally, he studied the loci of chromosomes which had crossed over. He concluded that it is possible to map chromosomes by comparison to a map of known locations.

Irene Cuffey of University High School, Bloomington, reported her research in a paper, "Biochemistry and Genetics of Certain Bacteria." Irene used over a thousand tests for her project. She used bacteria and bacteriophage for her research. She found that if bacteria were immune to bacteriophage, it was a result of a mutation. When the phage organisms are introduced into a medium containing bacteria, they will lyse the bacteria causing them to produce more phage particles. The second phase of her research involved antibiotic testing. This involved the streaking of one type of bacteria on agar and cross streaking with a second type. If one produced an antibiotic, the second was inhibited in its growth. She illustrated this with several pictures of the Petri dishes with the test organisms.

Vicki Schmidt of Franklin Central High School at Acton reported on "Internal Parasites in Mice and Men." Vicki used mice as her subjects because they are similar to man in relation to parasites. She had to weigh the mice and place them in separate cages. She used two methods for the determination of parasitism, the centrifuge and anal swab method. The second method is the simpler of the two. All one needs to do is examine the animal, place a piece of transparent tape at several places on the anus. The tape is removed and placed on a microscope slide with a drop of xylene. In order to locate the internal parasites, it is necessary to sacrifice the animal. Then the animal is dissected and the worms studied.

"Embryonic Heart Development of the Chick" was read by Richard Wettrick, North Vernon Junior-Senior High School, North Vernon. He reported that the heart of the chick embryo was a highly specialized blood vessel which beats without an external stimulus and that it developed systematically with blood vessels. He said that the embryonic heart does not function as the adult heart does, and that it was the first organ to develop in the organism. It is possible to see the heart with a microscope after twenty-four hours of development, and in 48 to 96 hours the atrium, ventricle, veins and arteries begin to develop.

Lysozyme is a naturally occurring substance found in tears, saliva, mucous secretions, and egg albumen and turnips according to Reba Koch of George Washington High School, Indianapolis. In her paper, "The Effect of Lysozymes on Bacteria," she reported that Fleming first observed the lytic effects of lysozyme. She used several quantities of dog tears, turnip juice, saliva, and egg albumen to determine if they had any affect on three types of bacteria. She found that they were more affective against gram positive than against gram negative bacteria. This could be explained by that fact that a second layer is found around the wall of gram negative organisms which is not present in gram positive ones, and it is easier for the lysozyme to penetrate the walls and lyse the bacteria.

In his study of the thymus gland and its removal, Greg Lumbr of University High School, Bloomington encountered two problems. One was the proximity of the thymus to vital organs, and the second was the open-heart surgery. In his paper, "Primary Investigation of Thy-mectomization on *Mus Norwegicus Albinus*: with Proposed Secondary

Investigation on the Effect of Thymectomy on Resistance to Bacterial Infestation," he reported that the thymus is most active when it weighs 45 to 50 grams. After the thymus was removed, he used a resuscitator to keep the lungs from collapsing. He said that the lymphocytes are produced by the thymus, and that the gland affects the rate of production of lymphocytes. The lymphocytes cause an immunological reaction on the body.

Janet Holscher, St. Rose Academy, Vincennes, in her paper, "Producing and Testing Penicillin," reported on her technique for obtaining *Penicillin* cultures. She obtained spores from an original culture of *Penicillium chrysogenum Wisconsin University Strain Q176* and transferred them to a penicillin production medium. She tested her work by using the fermentation broth of 1 ml. of penicillin broth per 9 ml. of water. She then saturated a filter paper disk and placed it on a Petri dish in which *Sarcina lutea* was growing. She then double checked her work by testing crystalline penicillin against the results of her broth culture. Clear zones of inhibition appeared around the disks if the penicillin inhibited the growth of *Sarcina lutea*. She found that the project took a lot of work, but the results rewarding.

"Effect of Temperature on Enzyme Induction in *Escherichia Coli*" was presented by Steve Barclay, Franklin Central High School, Acton. Steve reported that a living cell is induced to produce an enzyme when the proper "inducer" is present. Lactose served as an inducer for one phase of his work. Samples were taken every thirty minutes and were centrifuged. The fluid was poured off and a pellet was suspended in a phosphate buffer. The amount of protein present was measured and a qualitative analysis of the enzyme was made. He found, however, that the temperature had no effect on the enzyme production. He ran his control organisms at 43° Centigrade and his experimental Beta D organisms at 37° Centigrade.

An interest in tissue culture led Susie Talbott to report on "An Experiment in Tissue Culture." She reported that it was possible to keep cells alive outside natural environments. She used milk dilution and a special medium in with to grow her tissue cultures. The cells were titrated before being introduced into the medium, and then certain drugs were added. Nicotine was found to do considerable damage to the cells, and other drugs impeded the growth of the cells.

Using his linkage bars, Gordon Clark, George Washington High School, Indianapolis, explained the "Mathematical Relationship of the Four-Bar Linkage." He used three bars, two of equal length, and a third somewhat longer. A fourth bar was represented by the board to which the bars were affixed. He demonstrated how you could draw a figure eight and other figures by using these bars. Gordon explained that the principle of the linkage is important to industry and that the curves and lines drawn by the linkage can be determined mathematically by a formula which he had devised and proven to be accurate.

Craig Johnson, Washington High School, Indianapolis, explained his research with a "Living Fuel Cell." He explained that certain bacteria living in the sea are capable of taking the substances in the water and

converting them to electrical energy. These are the sulfur-bacteria which act upon substances and release the hydrogen ions. These in turn are responsible for the energy production. He suggested that these bacteria might be used in our space program to generate electricity. Craig said that sawdust, garbage, and other waste material had been used in the research on these bacteria.

Jane Richardville of St. Rose Academy, Vincennes, explained "The Transfer of P^{32} Through a Food Chain." She said that the purpose of her experiment was to demonstrate the decrease of the element phosphorus in its passage from one organism to another. She used *Elodea* plants, snails and fish for her experiment. Ten microcuries of P^{32} were introduced into the beaker containing the *Elodea*. After seven days, the count was 1,216. Six snails were placed in the beakers with the *Elodea* and after one week, they were monitored and a count of 112 was recorded. The snails were crushed and fed to fish. When the fish were monitored, a count of seventeen was recorded for the skeleton. She prepared radioautographs and found a definite difference in the film so that she concluded that some of the P^{32} remains in the organism or is lost by waste or decay.

"The Construction and Use of the 'Durrum Type Electrophoresis Cell' in the Study of Blood Protein" was presented by Tony Rice of Rex Mundi High School, Evansville. Tony built the power unit for his research. In order to have a good migration of the blood serum, the cell is run at 2.5 milli-amps for sixteen hours. He encountered several difficulties with the test unit and corrosion of his wire strips on the paper wicks in the buffer solution. He found that the protein was not migrating far enough with his early work and after investigation found that platinum wire was used in cells. He rectified this by using a stainless steel rod. Then he ran the electrophoresis strips for sixteen hours at 2.5 milli-amps. The migration now moved too far and the protein would thin out and would be very light. He then cut down the time to fourteen hours. Next he placed each strip in methanol rinse for six minutes, after which they were dyed in "B 4" dye for thirty minutes. Then they were rinsed three times for six minutes and the strips were dried over night on a steel plate.

Sherman Wolf, Washington High School, Indianapolis, reported on his hobby, "The Genetics of the Fantail Pigeon." He said that the color, powder blue, is a desirable one in the pigeon. When he mated two powder blues, he had several results. One was barred, a second was spotted, and the third was plain powdered. By backcrossing, he was able to produce only the powdered. Now he is working with red and yellow fantails in order to develop a strain of pure red ones.

Carl Bose, Westlane Junior High School, Indianapolis, reported on "The Amino Acid Composition of Ice Age and Modern Snails." He had collected several specimens of snail shells which were of the Ice Age period. Then by crushing and centrifuging he was able to have a fluid substance in which the amino acids were found. By using paper chromatography, he was able to make a comparison of the amino acids in each type of snail. But since the snails have not changed to any great

extent since their appearance on the earth, he found that there is little difference. The only difference in the snails at all is in their shape.

Michael Wright, Westlane Junior High School, Indianapolis, studied "The Position of Static Charges." Three phases were used for his investigation. The first involved an aluminum container and a static charge plate inside the container. Two electroscopes were used for the experiment. When the results were recorded, it was found that electroscope number 1 did not register an electrical charge, nor did the second one register. This indicated that the charge passed from the inside of the container to the outside, thus equalizing the static charges with the positive charges. The static charge was changed to a D.C. current in the second experiment. The results of this experiment were also negative. In the last phase, a glass container and a static charge were used. This time both electroscopes indicated an electrical charge. From his experiment, Michael concluded that: an electrical charge will pass to the outside of a container no matter whether it is a conductor nor not, a D.C. current will not necessarily pass to the outside, and the non-conductor slows down the passage of the charge to and from the inside.

"Column and Paper Chromatography" was reported on by Lynn Ann Knabel, Reitz Memorial High School, Evansville. She found that when she tested what seemed to be solid colors, they proved to be several. Lynn reported that colorless substances could be tested by the descending and elliptical methods, and that they too showed several colors to be present.

The final paper of the afternoon was presented by Cecilia Grannan of Reitz Memorial High School, Evansville. Her paper, "The Production of Cancer in Chicks," revealed that common carcinoma is caused by a virus. She injected the chicks twice with the virus in a 0.20 to 0.5 solution. When she autopsied her animals, she found that in addition to a lump on the breast, there were some on the gizzard. She said that reports of research indicate that there is a definite relationship between the virus and cancer.

The president, Craig Johnson, then thanked the Dean of Evansville College and the members of the faculty for making the facilities available to the Indiana Junior Academy of Science for their meeting.

He announced that Prof. Howard H. Michaud who had been a guiding light for the past seventeen years for the members of the Indiana Junior Academy was now the president of the Indiana Senior Academy of Science and Dr. Thomas Overmire of Ball State Teachers College would assume the duties of State Sponsor of the Indiana Junior Academy of Science. Craig introduced both Prof. Michaud and Dr. Overmire, thanking Prof. Michaud for his devotion to the Academy members and for his inspiration and guidance throughout the years he had served as State Sponsor.

Following this announcement, the meeting was adjourned at 4:30 p.m.

KATHRYN CRIDER, Secretary

INDIANA JUNIOR ACADEMY OF SCIENCE CLUBS

FALL OF 1962

<i>Towns</i>	<i>School and Club</i>	<i>Sponsor</i>
Acton	Franklin Central, Sigma Mu (1958)	Jerry Colglazier
Bloomington	H. S., National Scientific Honor Society (1931)	Merril L. Crisler
Bloomington	University Jr. H. S., MSE Club (1960)	Chas. Souers
Bloomington	University H. S., Jr. Academy (1938)	Don R. Winslow
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 Gromming
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)	Iva Spangler
Fort Wayne	Central Catholic H. S., Albertus Magnus Science Club (1952)	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. Academy of Science (1956)	Robert Weber Don Weaver
Gary	Lew Wallace H. S., Biology (1935)	Lola Lemon
Gary	Lew Wallace H. S., Klub Kem (1941)	Mrs. Helen McKenzie
Gary	Tolleston H. S., Biology (1952)	John Reidel
Gary	Tolleston H. S., Future Scientists of America (1949)	Arthur Kline
Gary	Wirt 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
Hamlet	H. S., Science (1954)	Lawrence Cushman
Highland	H. S., Science (1961)	
Hobart	H. S., Science (1952)	Lola Stewart

<i>Towns</i>	<i>School and Club</i>	<i>Sponsor</i>
Indianapolis	Fulton Jr. H. S., Science (1962)	Mrs. Bernadine 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
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	Westlane Jr. H. S., Science (1959)	John Van Sickle
Jeffersonville	Clark & Floyd County Seminar (1959)	Harold E. Cook 1019 Springdale Dr. Jeffersonville, Ind.
LaPorte	H. S., Bi-Phi-Chem (1958)	Francis M. Gourley Byron Bernard
Lebanon	H. S., Jr. Explorers of Science (1953)	Helen Reed
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)	Paul Carter
South Bend	Central H. S., JETS (1939)	V. C. Cripe
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